Vol. 121, No. 3

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

July 19, 1945

Canada Plans For Paper Industry's Future

Conference Called For August Expected To Define Long-Term Future Operations of Forest Resources—Free Enterprise Stressed — Social Security Is Dependent Upon Water Power and Forests.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., July 16, 1945—In the pulp and paper industry here attention is centering upon the Dominion-Provincial Conference which is scheduled to take place in Ottawa next month and which, to an appreciable extent, will decide the future course of Canada. Upon the result of its deliberations also depend many questions of vital importance to the future of the industry, decisions in regard to which are a necessary preliminary to long-term planning.

Many constitutional issues, long ripe for settlement, will come up for discussion. These revolve around the big question of federal versus provincial control of revenues and taxation. They involve labor legislation and business procedure in an important degree as well as national versus provincial interest in the development of natural resources, of which, of course, forests and water powers are a part.

Question of Income Taxes

Outstanding is the matter of the income taxes. Under the British North American Act, which is regarded as the constitution of Canada, direct taxation is reserved to the provinces. As a purely war measure the Federal Government instituted income taxes, which, of course, come under the heading of direct taxation, in the last war and has continued them ever since. Subsequently both provinces, and in some cases municipal governments added income taxes of their own, greatly complicating procedure and duplicating taxing powers. During the present war, and with the consent of the provinces, the Federal Government abrogated to itself the sole right to levy income taxes, as applied both to individual and to business firms, and instituted also succession taxes that duplicate provincial taxation. This was done purely as a war measure, an arrangement being made by which the provinces were reimbursed for the loss of revenue. Now the provinces are seeking a return of what they regard as their exclusive rights in these fields of taxation, and this involves many other issues.

From the point of view of the general public it was a great relief to be freed from duplicating taxation. From the point of view of the Federal Government there were two outstanding advantages—it could increase its revenues to the limit of what wsa considered necessary for war purposes and at the same time could control, by diverting into taxes, large sums of money which otherwise might be spent on civilian commodities and thus add immensely to the dangers of inflation.

From a national point of view the indications are that a return to the status quo is not practicable, first because of the vast expenditures necessitated by rehabilitation of the armed forces and secondly because of the heavy commitments in regard to social legislation which have been made by the Federal Government, including family allowances. During the interval the various provincial governments have been passing social legislation of their own as well as labor legislation duplicating or in actual conflict with labor legislation of the Federal Government. Now the provinces, in order to finance their social legislation and to obtain sole jurisdiction in labor matters, are clamoring for a return of their powers of taxation and for a clarification of their "rights" in respect to labor and other legislation. Back of it all is a tendency to "view with alarm" federal inroads on what are regarded as exclusively provincial rights.

"Full Employment" Objective

As far as the Federal Government is concerned, it is committed, as a primary policy, to the accomplishment of "a smooth and orderly transition from the economic conditions of war to those of peace and to the maintenance of a stable level of employment and income," the target in respect to the latter being "full employment." It lays down the principle that the active co-operation of all governments and groups in the country will be essential to the success of this program.

Among other proposals of the Federal Government are: that the manpower and resources released by demobilization shall be directed to the reconversion of industrial capacity released from war use and to the carrying out of desirable industrial expansion and modernization; the replacement and modernization of the equipment of primary industries and the provision of additional facilities for production and marketing purposes; and the providing of a large housing program, both urban and rural. The Government further proposes to influence expenditures in all channels calculated to maintain a high and stable level of employment and income, with particular emphasis on those which are most susceptible of encouragement and control.

Free Enterprise Versus State Socialism

The Federal Government lays down as a primary policy the encouragement of free enterprise and in this is diametrically opposed to the government of one province, namely Saskatchewan, which is committed to the principle of State Socialism. Recognizing that wartime taxation, both in its form and in its rates, is discouraging to new investment, it proposes to eliminate or minimize taxation which contributes to a higher level of production costs. Hence it promises a

(Continued on page 14)

Mills Meet to Discuss Fiber Situation

Symposium In Progress Under Auspices of Institute of Paper Chemistry Includes Prominent Paper Mills—Explains Marathon's Pulpwood Operations — Neenah Company Adds Improvements.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., July 16, 1945—A two-week fiber symposium is in progress at the Institute of Paper Chemistry, Appleton, Wis., under direction of John Graff, research associate at the Institute and a world authority on fiber microscopy. Technicians of the following 16 member mills are attending.

Bird and Son, Inc., Walpole, Mass.; Chesapeake-Camp Corporation, Franklin, Va.; Container Corporation of America, Chicago; Crane and Company, Inc., Dalton, Mass.; Deerfield Glassine Company, Monroe Bridge, Mass.; Eastman Kodak Company, Rochester, N. Y.; Escanaba Paper Company, Escanaba, Mich.; Fitchburg Paper Company, Fitchburg, Mass.; Gardener-Richardson Company, Middletown, Ohio; Hammermill Paper Company, Eria, Pa.; Marathon Corporation, Rothschild, Wis.; Nekoosa-Edwards Paper Company, Port Edwards and Nekoosa, Wis.; Northern Paper Mills, Green Bay, Wis.; Northwest Paper Company, Cloquet, Minn.; Riegel Paper Corporation, New Milford, N. J.; Wausau Paper Mills Company, Brokaw, Wis.

Explains Marathon's Pulpwood Operations

Motion pictures of the construction of Marathon Corporation's new paper mill at Marathon, Ontario, on Lake Superior, and of its pulpwood operations in the Pic river watershed and Magagami river area concessions were shown July 9 before the Kiwanis Club at Hotel Wausau, Wausau, Wis., by Howard Palmquist, Ashland, Wis., who is in charge of the corporation's pulpwood operations in Canada.

Mr. Palmquist said that the corporation has stumpage rights on nearly 4,000,000 acres of pulpwood lands in Canada. When the Ontario mill begins operations, he declared, a total of about 310,000 cords of pulpwood will be used annually by Marathon. The quota for the Rothschild mill for the current year is 35,000 cords, and this is expected to be increased. Pulpwood has been rafted across Lake Superior since 1934. This year shipments have been by rail.

From 85% to 95% is spruce, and trees 4 inches in diameter and more are being cut. The pictures showed cranes lifting four cord loads on sleigh-trucks, as many as ten being speedily hauled over iced roads with a tractor and unloaded on the Pic and Magagami. In the spring the logs are floated downstream, with a loss, due largely to the difficulty of floating the wood through sluiceways in the rapids of 3 to 5%.

Penninsula harbor, where the new community of Marathon is being built, was also shown. Mr. Palmquist reported that from 2,800 to 3,000 men will be employed in the woods operations and that 500 will be employed at the mill at Marathon. Heavy machinery used in constructing the Alcan highway is being used.

Mr. Palmquist was introduced to his audience by E. E. Zahn, who is in charge of the pulpwood department at the Rothschild mill.

Labor Board Holds Hearing

A panel of the Sixth Regional War Labor Board held a hearing July 10 on three issues in the dispute between Kaukauna Machine Corporation and the International Molders and Foundry Workers of North America, Local No. 289 (AFL). Involved were vacations, wages and maintenance of membership. The Regional WLB will receive the report of the panel, in which recommendations for settlement will be made.

Neenah Company Adds Improvements

A tar roof is being placed on the concrete loading platform now under construction of the Neenah Paper Company, Neenah, Wis. The platform is 12 by 65 and the estimated cost of construction is $3,000. The contract is in the hands of C. R. Meyer and Sons, Oshkosh, Wis.

Credit Union Buys More War Bonds

The Bull's Eye Credit Union, which serves employes of Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., has decided to buy another $10,000 of Series F bonds bringing the total holding in that series to $101,271.80. The union also holds other government securities totaling $65,000. Lawrence Villeneuve, president, stated that the credit union has assets totaling a quarter million.

Wausau Mills Helps Drill Well

Wausau Paper Mills Company, Brokaw, Wis., is cooperating in the drilling of a new municipal well, since it will use a large quantity of water. A new well has been drilled near the paper company property, but the quantity of water is under expectations. As a consequence another test well may be sunk.

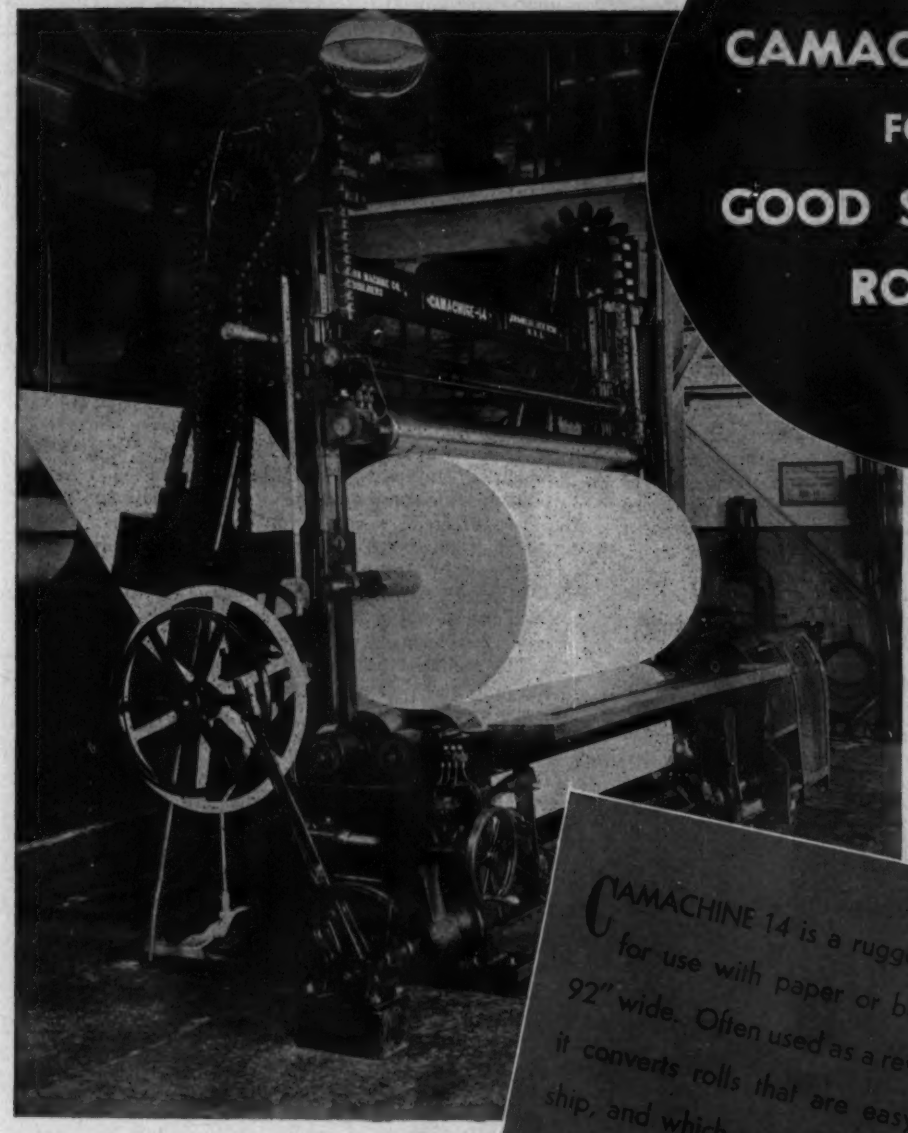
ODT Commends Kimberly-Clark

WASHINGTON, D. C., July 18, 1945—Commercial and industrial firms and corporations can help during the present transportation crisis by minimizing travel by their officials and employes, the Office of Defense Transportation pointed out today. The ODT commended recent action along this line by the Kimberly-Clark Corporation of Neenah, Wis., which had ordered its traffic department "not to accept applications from any executive or individual employe for railroad, Pullman, airplane, steamship or hotel reservations, except when presented in written form and carrying the confirming signature of an officer of the corporation." It was further ordered that "no person outside the employ of the company may at any time be permitted to use our traffic department facilities for private reservation or other purposes."

Chicago Banks on Playgrounds Collection

Demand for waste paper remained strong last week, with all grades much sought after. Trade sources reported a decline in collections expected in July and August was already setting in. The trade is therefore banking a great deal on the collections program sponsored by Chicago playground groups. Results of paper collections show that these groups of children have collected well over 10,000 pounds of paper in the last two weeks—a city record for all playgrounds with an equivalent number of children.

CAMACHINE 14 FOR GOOD SHIPPING ROLLS



CAMACHINE 14 is a rugged, high speed winder for use with paper or board machines up to 92" wide. Often used as a rewinder in larger mills it converts rolls that are easy to handle also to ship, and which are a credit to the mill supplying them. Be sure to include CAMACHINE 14 in your postwar plans. Write today for information.

CAMERON MACHINE COMPANY - 61 POPLAR ST. BROOKLYN 2, N. Y.

Midwest Office: 111 W. Monroe Street, Chicago 3, Ill.

L. J. Parant Retires

L. J. Parant, Vice President and General Manager of the St. Croix Paper Company, Woodland, Maine, retired on June 30th. He was active in the newsprint industry for a number of years. He went to Woodland in 1915, after eleven years with Finch, Pruyn Company at Glens Falls, N. Y. where he was superintendent. He was appointed general manager in 1923 and made director and vice president in 1930. Mr. Parant will remain on the Board of Directors of St. Croix Paper Company.

Mr. Parant was the father of safety in Maine and was one of the sponsors of the first Maine Safety Congress held in Augusta, November 15, 1928. Appalled by the number of accidents he appointed Walter J. Brennan as safety director of his company in 1926. Interested in politics he initiated the town manager form of government for the town of Baileyville, Me. and was its first council chairman in 1934. He served as vice president of the National Bank of Calais from 1933 to 1938, resigning after the bank which closed its doors in 1933 became one of the strongest banks in eastern Maine.

His hobbies were hunting and fishing and he was active in Anah Temple, A.A.O.N.M.S. Mr. and Mrs. Parant have purchased a residence and 100-acre farm in Kingsbury, Washington County, N. Y., only six miles from their old home in Glens Falls. Their post office address will be R.F.D. No. 1, Hudson Falls, N. Y..

Form Frederick E. Palmer & Company

The formation of a new company specializing in sales and engineering service has been announced from Montreal, P. Q. Operating under the name of Frederick E. Palmer & Company, this enterprise has been organized by Bob Palmer who has been associated with the pulp and paper industry since 1926, covering a wide range of experience in mill construction, operation, maintenance, equipment and pulp and paper machinery design, as well as sales of specialties to the industry.

Mr. Palmer has recently been connected with the C.P.P.A. Wartime Machine Shop Board as assistant coordinator of production in the maintenance machine shops of the Canadian pulp and paper mills. The accomplishments of these shops has been an outstanding contribution to the war effort.

Frederick E. Palmer & Company, P. O. Box 261, Station L, Westmount, Montreal, P. Q. would be glad to hear from United States firms who are contemplating sales in Canada, in either the pulp and paper or other industrial markets.

Powell River Moves Buying Offices

VANCOUVER, B. C., July 18, 1945—Transfer of the purchasing department of the Powell River Company from Powell River to the head office of the company in Vancouver has now been completed. R. A. Baker, purchasing agent, Oscar Smith, assistant purchasing agent, and other members of the staff of the purchasing department at Powell River have moved to Vancouver to assume their new duties.

Mr. Baker joined the Powell River Company in 1922 and has successively been secretary to the resident engineer, assistant chief clerk in the plant extension department, and secretary to the resident manager. He was appointed purchasing agent on September 1, 1939.

CANADA PLANS FOR FUTURE

(Continued from page 11)

reduction in the income taxes in the immediate future, both personal and corporate. Here it is faced with the prospect that if the provinces have the right to reimpose provincial income taxes, federal reductions will be offset by provincial impositions.

Another danger that the Federal Government seeks to avoid is duplication of public works for solving post-war unemployment problems. Provincial policy naturally runs to such expedients, which of course means added taxation.

Outstanding among the natural resources of the Dominion are water power and forests, the importance of which have been greatly emphasized by war demands for lumber in general and for pulp and paper products in particular. Undoubtedly public opinion in general is united on the desirability of overall federal plans for the conservation and development of the forests and water powers. The Federal Government's viewpoint is that these plans, besides affording supplementary sources for the maintenance of "full employment," will prove not sink-holes for expenditure, as some public works would prove, but true investment expenditures yielding valuable returns.

"Such expenditures," says a Government statement, "would provide some measure of alternative income in the area affected; would fight the appearance of depression at the point of contact rather than after it has spread through the whole economy; and would induce more private investment and not supplant it."

Such are some of the main items which will come up for consideration at the forthcoming conference. It will be realized how much of the long-term planning in the pulp and paper industry awaits the outcome of the meeting.

"Security" Depends on Forests

That the strongest "social security plan" for the Maritime Provinces, and equally for Quebec and Ontario, will be found in planned management of their provincial forest estates is the conviction of Howard P. Robinson, chairman of the board of the Telegraph-Journal, Saint John, N. B.

Senator G. P. Burchill of Newcastle, N. B., supplements the above statement by declaring that further expansion of industry and employment throughout Eastern Canada is firmly tied to the productive power of the nation's forests.

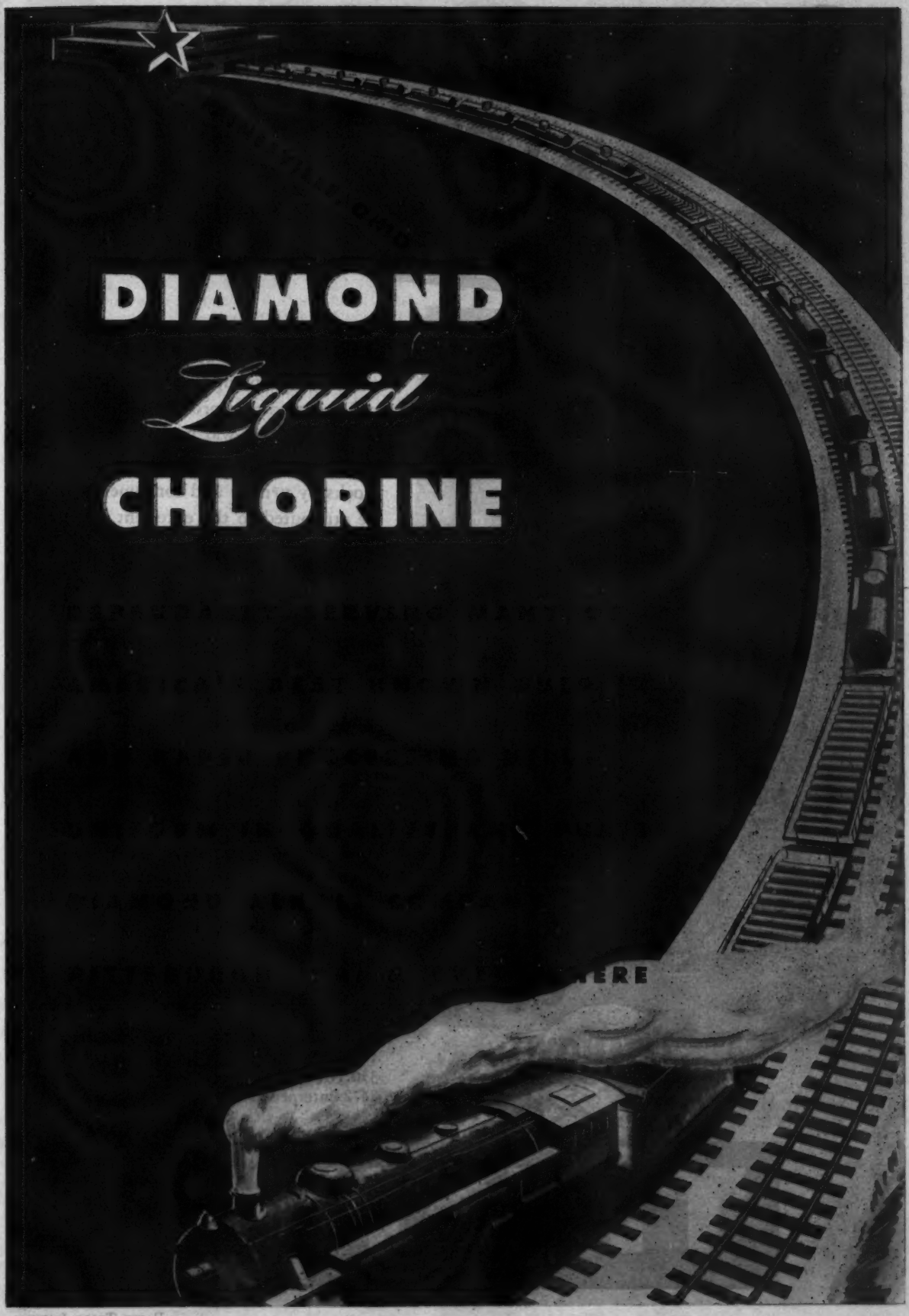
WPB Rules on Casein Imports

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 18, 1945—New licenses issued to importers of casein for third quarter purchases, as well as future casein import licenses, will not contain purchase price ceilings, the War Production Board reported today. The purchase price ceiling of 9½ cents per pound f.o.b. Buenos Aires on lactic casein and 16 cents per pound on rennet casein first appeared on licenses issued for the first quarter of 1944.

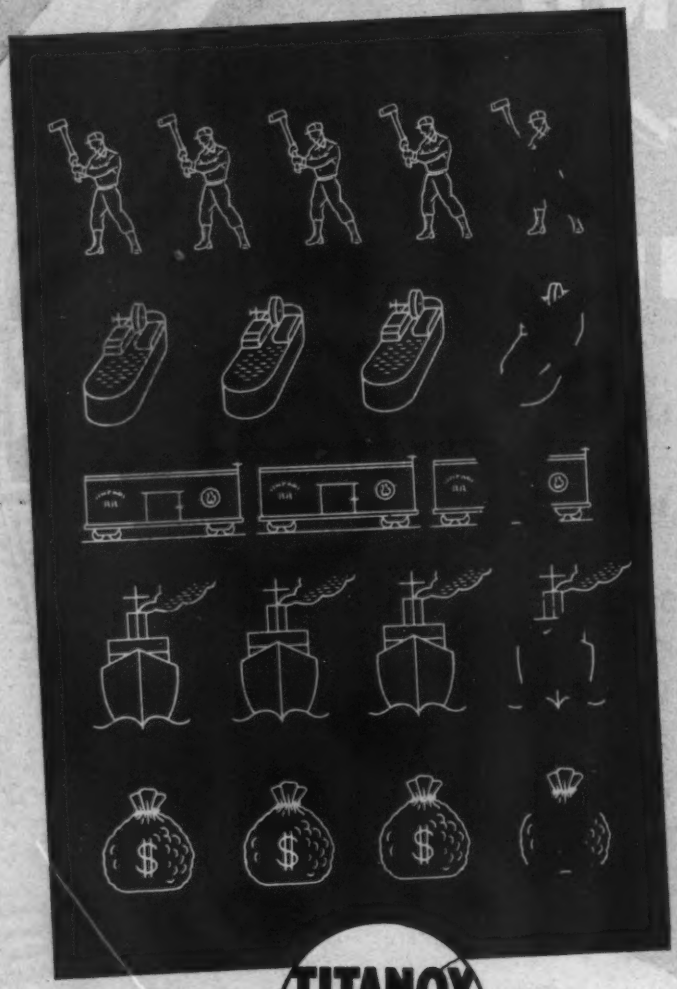
WPB said that this buying restriction is being lifted simultaneously by the British with whom close cooperation has been maintained in the purchase of casein and other dairy products in the Argentine. The price clause is no longer necessary under present conditions, WPB said.

A few additional import licenses involving small tonnages were granted to importers on a hardship basis. Other quotas were identical with those issued in the second quarter.


DIAMOND
Liquid
CHLORINE

Titanox FOR CONSERVATION...

Today... and Tomorrow



CERTAINLY THE WAR-TIME necessity for light-weight paper stocks to spread out available pulp supplies points a lesson in conservation that profitably can be carried over to the post-war period.

The general acceptance of light-weight stocks by printer and consumer alike may be attributed to the excellent qualities of opacity, whiteness and brightness and the fine printing surfaces imparted to such papers by titanium pigments. Indeed TITANOX, the original and best known of these pigments, has played an important role in minimizing the impact of war-time restrictions on the printing world.

In view of the far reaching advantages deriving from the production and use of lighter weight stocks, such as conservation of manpower, pulp, transportation, mailing costs and the like, manufacturers may well consider carrying many of these lines into the post-war period. Today it is "yardage" as against "weight" in the paper field. Why not project this idea into your plans for the future?

TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT
111 Broadway, New York 6, New York
104 South Michigan Avenue, Chicago 3, Illinois
350 Townsend Street, San Francisco 7, California
2472 Enterprise Street, Los Angeles 21, California

TITANOX
REG. U.S. PAT. OFF.

TITANOX
REG. U. S. PAT. OFF.

B. C. Loggers Present New Policy

VANCOUVER, B. C., July 18, 1945—Sixteen major recommendations which were suggested to serve as a basis for a new forest policy for the West Coast, were presented to the Royal Commission investigating the forest industry in British Columbia recently by the British Columbia Loggers' Association. The association frankly admitted that the whole forest economy of British Columbia to date had been based on immediate profit and revenue.

The association's brief asked primarily for constitution of a Forest Appeal Board, under permanent chairmanship of a justice of the Supreme Court of British Columbia to be the final authority in all disputes between the crown and private logging interests.

The association proposed that in addition to a chief justice as chairman, four additional members should be appointed without remuneration for terms of five to ten years. One member should be chairman of the standing committee of the Legislature on forestry, two members should represent the forest industry, and one the general public.

Other recommendations included:

1. Establishment of a coast forest fire commission as an independent authority and financed by private and crown timber interests to administer forest protection.

2. That any new forest laws or regulations be adopted only after careful consideration of the province's position in the world lumber market—a highly competitive export field in postwar days.

3. That no arbitrary restriction on cutting of logs was justified on private forest lands in the coast region.

4. That a "much greater proportion of direct forest revenues" be returned to the forests for protection and perpetuation.

5. That a larger technical staff be employed—at suitable salaries—to aid implementation of a "new deal" in B. C. forests.

6. That facilities in forest training at the University of British Columbia be expanded and that education in forest matters be given special attention in schools.

The brief, submitted on behalf of the association, the pulp and paper industry, of British Columbia and the Truck Loggers' Association, was read by Maj. L. R. Andrews. It stated that assurance of continuous forest crops, maximum production and employment rested on joint action by the government, the industry and the public.

Solution of the forest fire problem was the "most vital and urgent obligation" facing all parties.

Broad recommendations of the association called for:

1. A comprehensive regeneration survey of all coast lands depleted of timber.

2. Expansion of government nurseries to supply adequate seedlings for anticipated requirement—both crown and private.

3. Reduction of rentals and taxes on privately owned and held forest lands being regenerated until new crops were harvested.

4. No more heavy penalty than the crown right to expropriate be imposed for failure to meet compulsory regeneration regulations on private land.

5. Constitution of coast forests as a single overriding working circle during the period of transition to sustain yield.

"Hope of fair return to the industry from huge investments now committeed in forest enterprises is vitally bound up in whatever long-range plans are adopted for the future," it was emphasized.

Attainment of sustained yield management of west coast forests would involve an increase in expenses to the industry, increased expenditure of forest revenue for forest purposes and for the public "somewhat less net revenue" than previously.

Capital invested in the industry in B. C. amounted to $154,112,211.

The brief pointed out that since B. C. contributed annually about $150,000,000 in direct taxes during the war to the Dominion Government, the forest industry—on the basis that 40 per cent of the province's income was from forests—in 1942 contributed some $60,000,000.

There was no guarantee that the future held promise of stabilized prices at profitable levels.

Northern European timber soon would make inroads in B. C. markets—the United Kingdom, the United States, South Africa and Australia. B. C. was farther away from its markets than any forest region in the world.

British Empire preference did give B. C. lumber an advantage of 10 per cent in the United Kingdom over American, Baltic or Russian lumber on the cost of lumber and freight.

Greater utilization of small logs appeared necessary—but it was not possible for the government to generalize in this connection. Logging operators felt that Dominion tax regulations outlined in correspondence between the minister of national revenue and Mr. Justice Sloan, who conducts the forest enquiry, should be "revised and extended to meet the new economic conditions facing the industry and the province in the postwar period."

"We are of the opinion that it will prove in the long-range public interest to foster and encourage private forestry in B. C. to the greatest extent possible," they stated.

Tells World Where Salvage Money Goes

CHICAGO, July 18 1945—John R. Robinson, general chairman of the Chicago Waste Paper Salvage Committee, this week took occasion to point out to critics just how the proceeds of Chicago's waste paper salvage are handled. Every pound of waste paper collected in Chicago's schools, he states, is gathered under the direct supervision of his Committee, a body composed of key officials of 14 civic, manufacturing, municipal and governmental groups.

All money derived by a school from the sale of waste paper is retained by the school itself. Eighty-three authorized waste paper dealers, under the absolute control of the committee, pay ceiling prices to the schools for the paper. Funds are kept in a special account by each school and spent for those extra-curricular activities in which all schools engage and for which no budget from the taxpayers funds is provided.

THIS particular couch roll is attracting wide interest and attention. It is the first of many synthetic rubber rolls to be installed in one of the nation's largest board mills.

Recently the machine tender told us that the roll has just the right degree of resilience and is doing a fine job.

This mill is particularly proud of a record which has put it among the top producers of paper board this year.

We are no less proud of the contributions United States Rubber Company engineers have made in developing exactly the right compound for the specific job.

Serving Through Science

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

Source of "Firsts"

Modern Research Laboratory at Niagara Plant as interpreted by the artist, John Gaydos

THE FACT that Niagara was the first to produce several important electro-chemical products in this country is due in great part to the efficiency of its research. Niagara's research activities are under the supervision of men of long and thorough experience in electro-chemical development, manufacture, and usage. This has enabled Niagara to give valuable cooperation to many industries using such products in the processing of war materials. It will prove of equal value in helping these industries convert efficiently to peacetime manufacture. Look to Niagara for experienced chemical service.

Niagara ALKALI COMPANY

60 EAST 42nd STREET, NEW YORK 17, N. Y.

CAUSTIC POTASH • CAUSTIC SODA • PARADICHLOROBENZENE • CARBONATE OF POTASH • LIQUID CHLORINE

WPB Changes Paper Cup Order

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 18, 1945—Because of the increased necessity for insuring that hot drink cups are used only for the purposes for which they are permitted, a certificate for each delivery of hot drink cups must hereafter be furnished the manufacturer, the War Production Board said today, and the wholesaler and jobber must pass on the original certifications received by them in all instances.

The Paper Cup and Nested Food Container Industry Advisory Committee at its meeting on June 18, 1945, recommended this change from a one-time certificate, WPB said, and an amendment effective today to Order L-336, which limits the manufacturer, delivery and use of certain sanitary food containers, covers the new requirement.

A new production set-aside of 50% of all 10 to 12-ounce hot drink cups for military requirements has been inserted in the paragraph dealing with the distribution of production between military and civilian customers.

Monthly quota restrictions on the use of hot drink cups have been deleted, since experience has shown those to be a burden on industry, withou taccomplishing the desired result. It is believed that controls on the use of these cups are now sufficient without the quota limitations.

Newsprint Use Off Slightly in June

Daily newspapers reporting to the American Newspaper Publishers Association consumed 190,511 tons of newsprint paper in June 1945 compared with 191,077 tons in 1944 and 242,404 tons in 1941. This was a decrease in June 1945 under June 1944 of 0.3% and a decrease under June 1941 of 21.4%. The year 1941 is the base for calculating allowable use by newspapers.

The total estimated newsprint consumption in the United States for June 1945 was 272,159 tons which includes all kinds of uses of newsprint paper. For the first six months of 1945, it was estimated to be 1,660,856 tons.

Swedish Wood Pulp Arrives

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, July 15, 1945—The steamship Belos, the first Swedish merchant ship to arrive here in more than five years, today docked at the Mystic Docks with a cargo of 4,300 tons of pulp wood consigned to New England paper mills.

Her sister ship, the steamship Consul Corfitzer, is due in New York with an additional 4,100 tons of pulp.

Captain Hellborg said his company has contracted to ship wood pulp regularly to the United States ports of Portland, Me., Boston, New York and Baltimore, Md.

Karl Prindle Elected Vice-President

The Board of Directors of the Dobeckmun Company, Cleveland, Ohio, announce the appointment of Karl E. Prindle as vice-president in charge of Product Development. Mr. Prindle has been associated with the Dobeckmun company since April 1932, coming with them initially to develop improved machine-applied adhesives for the then new cellophane bags of which Dobeckmun was the first manufacturer.

Chicago Doubts Quick Betterment

CHICAGO, July 18, 1945—While some shipments of Swedish pulp are reported to have reached this country within the last two weeks, no one in the Chicago area is of the belief that this will mean any material change in conditions. The feeling persists that July will mark the turning point in paper conditions, but there is a definitely marked belief here that the backlog of needs is too great to give any immediate cause for real optimism. Even if the pulp and paper supply should finally start on the upward swing local paper merchants point to the big shortage in the supplies and the backlog of demand, which has been reported in some quarters as reaching 650,000 tons. This figure is said to be for immediate needs, with possibly 300,000 added tons for taking care of seriously diminished inventories.

Along with the supply program, the industry in this area shows increasing concern over its inability to cover increased operating and production costs under current price ceilings. There continues to be a rather general belief that more incentive in the form of price increases would overcome, at least partially, the handicap of manpower and pulp shortages and aid materially in curtailing any future dangers of inflationary spirals in paper inventories.

Eases Rules for Small Converters

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 18, 1945—Regulations controlling small manufacturers of paper products, known as converters of pulp, paper and paperboard, have been relaxed by amendment of Conservation Order M-241-a (paper and paperboard), the Paper Division of the War Production Board announced today.

Converters who consumed less than five tons of pulp, paper or paperboard per quarter in 1942, or none of these substances in the same period, may now use five tons per quarter in the manufacture of any converted paper products under the amendment to the order, WPB officials explained.

The quarterly paper quota of converters manufacturing unlisted products was increased from 65 to 80% of the tonnage similarly consumed in a corresponding quarter in the base period 1942, although the tonnage of pulp and paperboard is still limited to the 65% level as heretofore.

Order M-241-a still limits the manufacture of listed restricted products to percentages running from 80 to 110% of 1942 production, it was pointed out.

Blandin Sales to Bulkley Dunton

CHICAGO, July 18, 1945—Effective July 1, the Blandin Paper Company has turned its entire sales outlet program over to Bulkley Dunton & Company which is reported to be opening a Chicago office, reportedly in the Conway Building, to handle this entire sales job. Frank Foley, formerly in charge of Blandin sales operations in this territory, has resigned. He has as yet made no announcement as to his future plans.

American Writing Paper Adds to Mill

HOLYOKE, Mass., July 16, 1945—Work is in progress on an addition to a mill building for the American Writing Paper Corporation. It is to be of brick, one story, with brick foundations, flat tar and gravel roof and steam heat, at a cost of $15,000.

WORLD'S LARGEST PRODUCER OF SYNTHETIC RESINS

RCI

proving its superiority

in the world's dampest spot

THE WET-STRENGTH RESIN **P-426**

BECKAMINE

Although this product comes under WPB allocation, ordering is easy, and orders for most end uses are being approved. Simply fill out WPB-2945 forms stating the name of the resin (P-426 Beckamine) and the intended end use. Then send 3 copies to WPB . . . to arrive on or before the 15th of the month . . . and one to our Sales Department with your order. Shipments will be made as soon as we receive WPB approval of your order.

There could be no better proof of the efficiency of P-426 Beckamine in imparting wet-strength than its use in the production of diaper paper. And heightened wet-strength is only one result of its use. This urea-formaldehyde resin increases tensile strength, fold and mullin as well. It can be applied directly in the beater, fan pump, or head box—or directly to the sheet at the size press—and it is notable for stability in storage. Ask the RCI Sales Department at Detroit for additional details.

Saturday Evenings at 8:30 (E.W.T.)
You Will Enjoy RCI's
"Symphony of the Americas"
Via Mutual Network Stations

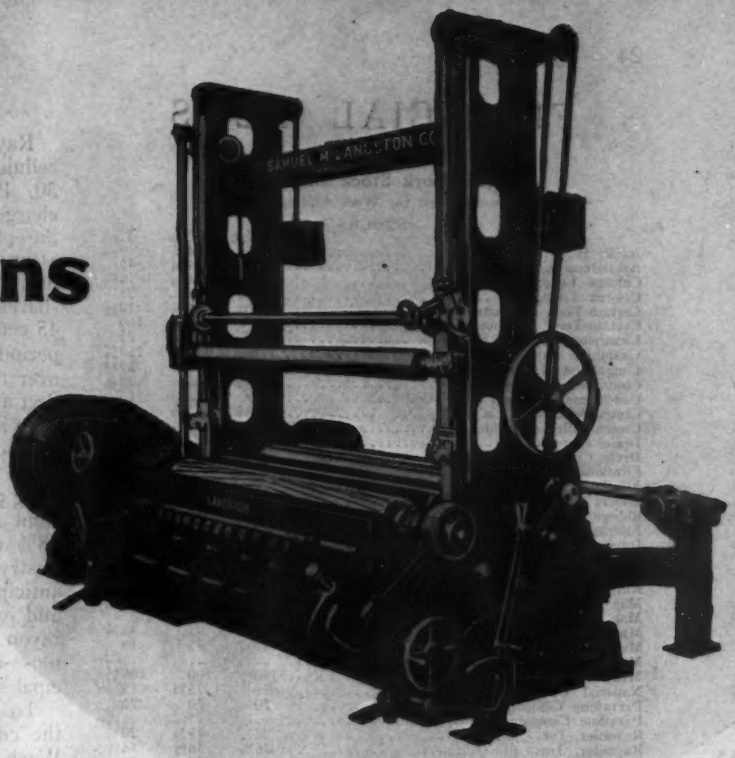
REICHHOLD CHEMICALS, INC.

General Offices and Main Plant, Detroit 20, Michigan

Other Plants: Brooklyn, New York • Elizabeth, New Jersey • South San Francisco, California • Tuscaloosa, Alabama • Liverpool, England • Sydney, Australia

SYNTHETIC RESINS • CHEMICAL COLORS • INDUSTRIAL PLASTICS • INDUSTRIAL CHEMICALS

Successful Combinations



On the breakfast tables of America, "oatmeal-and-cream" has always been a popular team. The familiar Quaker Oats package that brings you this wholesome food is made with the help of a Langston "BA" Slitter and Roll Winder. Noted for the excellence of their products, The Quaker Oats Company, Chicago, find that Langston Slitters fully meet their exacting standards in the production of the package.

Wherever paper is processed; in the Mill, the Finishing Room, or the Converting Plant—Langston Slitters and Roll Winders assure dependable, trouble-free service.

SAMUEL M. LANGSTON COMPANY
CAMDEN, N. J.

Langston

SLITTERS AND ROLL WINDERS

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending July 14, 1945

STOCKS

	High	Low	Last
A. P. W.	6¾	6⅝	6¾
Armstrong Cork Co.	45¾	44¾	45
Celotex Corp.	16⅞	16¼	16¾
Celotex Corp., pf.	21⅜	21	21
Certain-Teed Products Corp.	10¾	10¼	10⅝
Certain-Teed Products Corp., pf.	160	158½	160
Champion Paper & Fibre Co.	35¾	35	35
Champion Paper & Fibre Co., pf.	110¼	110¼	110¼
Congoleum Nairn Co.	30	29½	29⅝
Container Corp. of America	28¾	28⅜	28¾
Continental-Diamond Fibre Co.	13	12½	13
Crown-Zellerbach Co.	23¼	22½	22⅝
Crown-Zellerbach Co., pf.	104¼	103¾	104
Dixie Cup Co.	28	27½	27½
Dixie Cup Co.—A	48⅛	48⅛	48⅛
Flintkote Co.	29¾	29	29⅛
Flintkote Co., pf.	109	109	109
Robert Gair	6¾	6¼	6¼
Robert Gair, pf.	18⅜	18	18⅛
International Paper Co.	27⅞	27	27½
International Paper Co., pf.	99½	98½	99¼
Johns-Manville Corp.	121¾	120¾	121
Johns-Manville Corp., pf.	....	....	....
Kimberly-Clark Corp.	46½	45½	46¼
Mac Andrews & Forbes	33⅛	33⅛	33⅛
Mac Andrews & Forbes, pf.	....	....	....
Masonite Corp.	44¾	43	43⅞
Mead Corp.	15¾	15	15
Mead Corp., pf. A—6%	....	....	....
Mead Corp., pf. B—5½%	100½	100	100½
National Container Corp.	16	15⅜	15½
Parraffine Companies, Inc.	70	70	70
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	21¼	19⅞	20
Rayonier, Inc., pf.	36⅞	36¼	36¼
Ruberoid Co.	36½	36	36½
Scott Paper Co.	50½	49¼	49¼
Scott Paper Co., pf.	112½	112	112
Sutherland Paper Co.	34	34	34
Union Bag & Paper Corp.	17¾	16⅞	16⅞
United Paperboard Co.	7⅞	7½	7⅞
U. S. Gypsum Co.	91½	90	91½
U. S. Gypsum Co., pf.	192	190¼	190¼
West Virginia Pulp & Paper Co.	30	29¼	30
West Virginia Pulp & Paper Co., pf.	113	112	113

BONDS

Abitibi Pulp & Paper Co. 5s '53	102½	101¾	101¾
Celotex Corp. 3¾s '55	104	104	104
Certain-Teed Products Corp. 5½s '48	....	....	....
Champion Paper & Fibre Co. 4½s '50	....	....	....
International Paper Co. 6s '55	109	109¼	109
International Paper Co. 5s '47	105½	104⅝	105½
Mead Corp. 3½s '53	....	....	....
West Virginia Pulp & Paper Co. 3s '54	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending July 14, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	40½	40	40⅛
Hummel-Ross Fibre Corp.	10¼	9	9½
St. Regis Paper Co.	7½	7⅛	7⅛
St. Regis Paper Co., pf.	....	....	....
Taggart Corp.	6⅜	6⅜	6⅜

BONDS

American Writing Paper Co. 6s '61	....	....	....

Pacific Mills Issues Report

Pacific Mills, Ltd., Vancouver, B. C., in its twenty-ninth annual report for the fiscal year ended April 30, 1945, reports a net profit of $918,512, and a profit of $10.65 per common share, after providing for preferred dividends.

Net sales for the period totaled $10,398,361, compared with $10,269,297 in 1944.

Sterling Pulpwood Corp. Formed

[FROM OUR REGULAR CORRESPONDENT]

LANSING, Mich., July 16, 1945—The State Corporation and Securities Commission has received articles in incorporation from the Sterling Pulpwood Corporation, Wakefield, to manufacture and sell pulpwood and other forest products. It is capitalized at no par common. The incorporator is Charles M. Humphrey, Ironwood, Mich.

Rayonier Sales and Profits Up

Rayonier, Incorporated, manufacturer of wood cellulose, in its annual report for the year ended April 30, 1945 showed consolidated net profit after all charges of $1,839,126, compared with $1,688,709 in the previous fiscal year. The earnings were equal, after dividends of $1,252,410 on the $2 cumulative preferred stock, to 61 cents per share on the 963,871 shares of common stock outstanding, compared with 45 cents per share in the previous year. Sales for the period amounted to $25,969,823, an increase of 13.8% over the 1944 total of $22,823,538. These figures reflect a gain of 4.4% in tonnage sales.

In his comments to stockholders, President Edward Bartsch stated that the demand for wood cellulose taxed to capacity the facilities of the company's operating plants. About 75% of the total tonnage produced went to the rayon industry. Wood pulp constituted 78% of the total cellulose requirements of that industry during the 1944 calendar year. The company anticipates no reconversion problems after the war, and expects a continued increase in consumption of rayon, cellophane, photographic papers and other cellulose-base products for which Rayonier is the principal supplier of pulps.

To meet the growing requirements of customers, the company is taking steps to reopen its Shelton, Wash., mill which has been closed since August 1943 because of a log shortage. The company added substantially to its timber resources during the year. With Shelton operating, the company's present annual output will be increased by about 25%.

A $9,000,000 term loan was arranged last April to provide funds for the acquisition of additional timberlands and logging equipment, the retirement of bank loans, and a general program of plant and product improvements now in progress. Mr. Bartsch reported that the company was vigorously pursuing its policy of improving the quality of its pulps and obtaining greater efficiency in manufacturing methods.

Champion Makes Good Report

The Champion Paper and Fibre Company did the largest volume of business in its history in the year ended April 30, 1945, when sales reached $48,485,213. This total compared with $6,249,013 the previous year, $43,164,427 in the 1943 fiscal year, $42,257,385 in 1942 and $29,743,122 in the year ended April 7, 1941.

Due to increased federal taxes and higher operating costs the net profit of the company for the year ended April 30, 1945, was $1,803,864, compared with $1,970,527 the previous year, $2,532,213 in 1943 and $3,129,986 in the year ended April 26, 1942.

Mead Corp. Sells Big Bond Issue

The Mead Corporation has sold $8,000,000 of an authorized issue of $10,000,000 of 3⅛% 15-year first mortgage bonds to four insurance companies and has paid off $6,000,000 of 3¼% bonds of which $600,000 mature annually until 1955. Remaining proceeds of the offering have been set aside for general corporate purposes, the company announced.

The new bonds mature at the rate of $200,000 semi-annually from 1951 to 1953 and $400,000 semi-annually from 1954 to 1959, with $2,000,000 due on May 1, 1960. A contingent sinking fund will begin in 1951 amounting annually to 10 per cent of net earnings after preferred dividends in the preceding years.

Can We Help?

Are you taking full advantage of Hercules' Technical Service in solving your current sizing problems? Let us show you how the Paracols* and other special Hercules sizing materials can help. *Write, wire, or phone!*

PAPER MAKERS CHEMICAL DEPARTMENT

HERCULES POWDER COMPANY

INCORPORATED

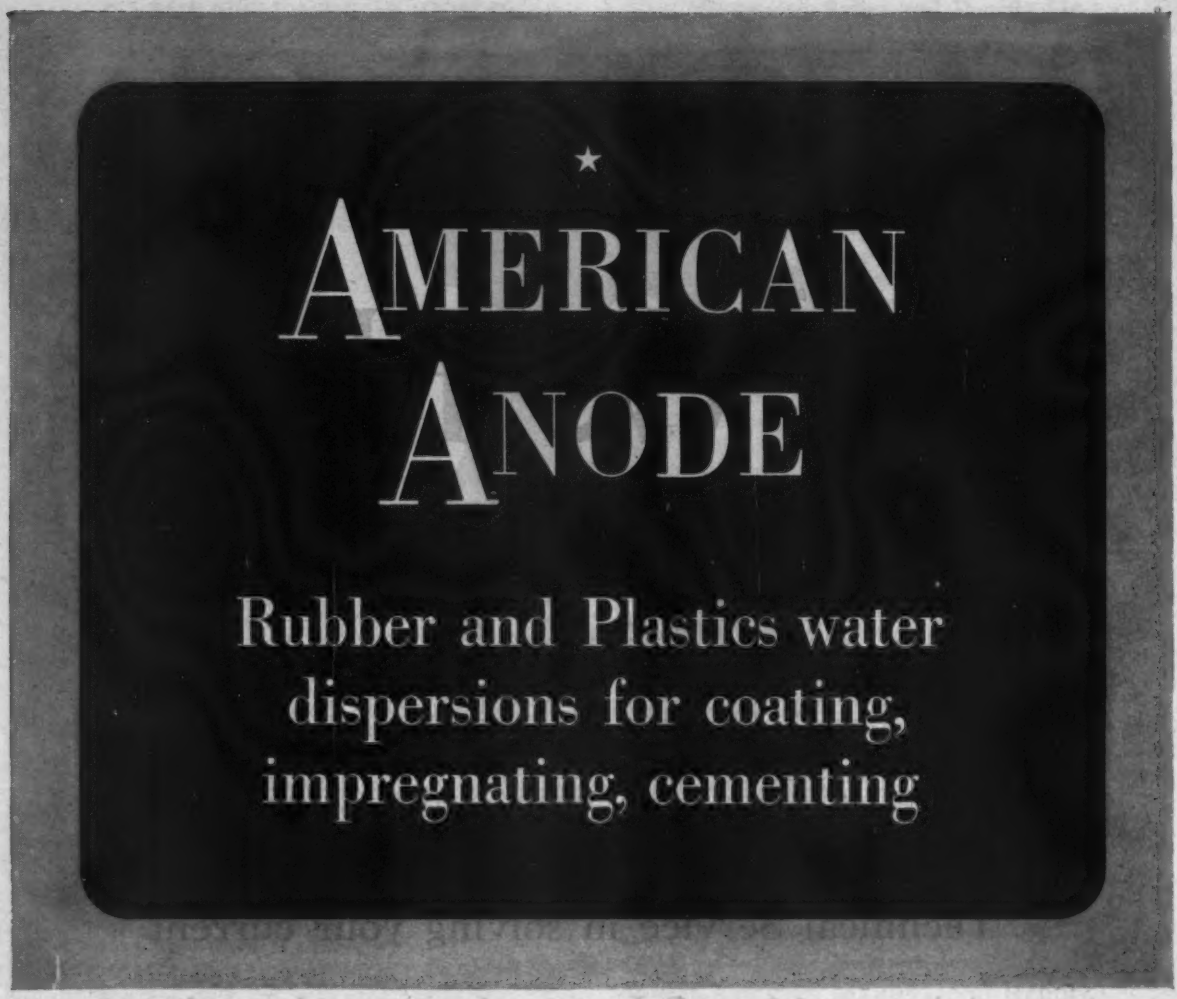
962 KING STREET, WILMINGTON 99, DELAWARE

Branch Offices: Holyoke, Mass.; Kalamazoo, Mich.; Marrero, La.; Portland, Ore.

In Canada: Hercules Powder Company (Canada) Limited, Preston, Ont.

* Reg. U. S. Pat. Off. by Hercules Powder Company

PI-32R



Pioneer in water systems seeks problems relating to paper treatment

THERE are three good reasons why American Anode water dispersions of natural and synthetic rubbers and plastics can be used to advantage in treating paper.

First, there's the *experience* that American Anode has accumulated over a period of many years. American Anode pioneered the work with water dispersed rubbers and plastics. That's why we invite you to submit your paper treatment problems to our development laboratory staff. We honestly believe that we can help you because we *know* how to use water dispersions most effectively.

Second, there's *economy.* Water systems do away with the need for expensive solvents and cumbersome solvent recovery systems. Processing is simplified. In most cases, it actually *costs less* to treat paper using a water dispersion.

Third, there's *safety.* Water just won't explode, causing dangerous and expensive fires. Nor will water give off toxic fumes. Our laboratory facilities and research staff are at your service. For more information please write American Anode, Inc., 60 Cherry Street, Akron, Ohio.

AMERICAN ANODE
INCORPORATED
NATURAL AND SYNTHETIC RUBBER LATICES, WATER CEMENTS AND SUSPENSIONS

• *The Dry Ice Plant of Wyandotte Chemicals Corporation at Wyandotte, Michigan, is the world's largest. Each of its huge ice presses exerts a pressure of one million pounds. This, applied to carbon dioxide "snow," produces a 240-lb. cake of dry ice—140° colder than ordinary ice. Some of these cakes are seen ready to leave the presses.*

WYANDOTTE CHEMICALS CORPORATION

ONE OF THE WORLD'S GREAT PRODUCERS OF CHEMICALS

SODA ASH
CAUSTIC SODA
BICARBONATE OF SODA
CALCIUM CARBONATE
CALCIUM CHLORIDE
CHLORINE
HYDROGEN
SODIUM ZINCATES
AROMATIC INTERMEDIATES
DRY ICE
Other Organic and Inorganic Chemicals

WYANDOTTE CHEMICALS CORPORATION
MICHIGAN ALKALI DIVISION • WYANDOTTE, MICHIGAN

Wyandotte
REG. U. S. PAT. OFF.

VITAL TO VICTORY TODAY—READY TO WORK FOR A GREATER TOMORROW

Container Heads Lead War Fund Drive

CHICAGO, July 18, 1945—The paper industry is going to take a prominent part in the forthcoming Chicago Community and War Fund Drive under the leadership of Walter Paepcke, chairman of the board of the Container Corporation of America. One of his right hand executives, W. H. Gellersted, who is operating head of the Pioneer Paper Stock division, is to be chairman of the paper division. The vice-chairman, as announced this week, is A. S. Daniels, top executive with the W. C. Ritchie Company of this city. Back of Mr. Paepcke's interest in the forthcoming drive is the story of an outstanding paper and allied products company which is really giving of its time and money to the success of an important community project.

Not only the top executive of Container is giving of his time and effort to the Drive but another major executive recently head of the Peoples Gas Company and now with Container, is taking a prominent part in the campaign in the person of James Cunningham, well known Chicago industrialist. Still another Container executive, Wesley Dixon, is helping to line up the personnel of the paper group for the coming drive, giving generously of his time and experience acquired in past campaigns. A junior executive of the firm, James Harbison, has also taken over one of the "lend lease secretary" jobs, meaning a lot of time and detail work in getting things going and keeping them going. On top of this outstanding performance, Container Corporation of America employees were very near the top in employee average salary contributions in the last drive—a remarkable all around record that does a great deal of credit to the paper trade.

Peerless Elects Sheppard President

OAKS, Pa., July 18, 1945—Lewis I. Rossiter has resigned as president of the Peerless Paper Mills, to become chairman of the board. Isaac J. Sheppard has been elected president; Fred T. Cage, vice-president and general manager; Nelson Easton, secretary and manager of paper mill production and Albert P. Wilson, treasurer.

James G. Tomlinson will continue as superintendent of the toilet paper and paper towel converting department and George Lenz as superintendent of the paper mill. Mr. Rossiter will continue his services with the Company in an advisory capacity.

Printing Craftsmen Plan Convention

COLUMBUS, Ohio, July 19, 1945—The 26th Annual Meeting of the International Association of Printing House Craftsmen, Inc., will be held in the Deshler-Wallick hotel, August 6 and 7, 1945. Registration will be limited to one delegate from each Club affiliated with the Association, and residents of the Columbus area. No ladies living outside the Columbus area will be permitted to register, except as official delegates from local Clubs.

Abana Products Moves

CHICAGO, July 18, 1945—The Abana Products Division of the General Shippers Supply Company has recently been moved to 2460 N. Pulaski Road. The new quarters are larger than those at the former location at 2247 S. LaSalle Street and the new location will likewise permit better shipping and receiving facilities.

PWOC Committee Organizes Campaign

CLEVELAND—Plans for an intensification of the organizing drive in the paper industry and a demand for revision of the national wage policy were made by the Paper Workers Organizing Committee at an executive board meeting and two day staff conference held in Cleveland, June 28-30. Area conferences will be held later this year.

This was the first such conference held by PWOC. It was attended by PWOC staff members, CIO regional directors and representatives, and national CIO leaders. Local CIO leaders, ministers, educators and representatives of government agencies attended the banquet held at the Hotel Hollenden, where the staff conference also took place.

Sessions were chaired by PWOC Chairman Allan S. Haywood, who was also the featured speaker at the banquet attended by eighty members of the PWOC staff and friends. Others who addressed the banquet were R. J. Thomas of the United Auto workers, President Sherman Dalrymple of the United Rubber Workers, PWOC Director Walter Smethurst and Assistant Director Frank Grasso. PWOC Secretary-Treasurer Harry D. Sayre was the toastmaster.

Following Chairman Haywood's opening remarks, the conference opened with a talk by Kermit Eby, National Director of Education and Research for the CIO.

The conference was also addressed by G. George De Nucci, Secretary of the Ohio CIO Council, who spoke on state legislative matters and public relations; Helen Blanchard, Director of Organization of the CIO Women's Auxiliaries, on women in industry; Delmond Garst, Executive Assistant to CIO members on WLB spoke on WLB policies; Tom Owens of the CIO legislative committee on national legislative matters; Arthur Stark of the 8th regional office of the NLRB on NLRB procedure and policy, and Ted Silvey, Chairman of the CIO Veterans Committee spoke on veterans problems.

President R. J. Thomas of the United Auto Workers told the conference of the necessity for an international outlook because of the interdependency of all countries in the world. Wages of American workers and their conditions are affected by conditions in Europe and Asia, Thomas pointed out.

A large part of the second day of the conferences was devoted to the organizing campaign in the paper industry and problems of administration of PWOC local unions. Director Smethurst, Assistant Oirector Grasso and Secretary Sayre led these discussions. Nat Goldfinger, PWOC editor led the discussion on the function and role of the PWOC paper.

Chairman Haywood addressed the conference on the importance of the organizing campaign. At the banquet, Haywood pointed out that the CIO was carrying on the practical work in the modern world begun by the Nazarene two thousand years ago. The CIO is in the forefront of every move for greater freedom and benefits for the plain people, he said.

Two slide films on grievance procedure and seniority were also shown. Though most in attendance had not seen such pictures before, there was enthusiastic interest shown.

Chairman Haywood, who is also vice president and director of organization for the national CIO, concluded the conference with an appeal to intensify the organizing campaign in the paper industry and to build a mighty CIO paper workers' international union.

Recent Developments at Impco

AND MORE—

- Soda and Kraft Brown Stock Washers
- High Density Stock Storage Systems
- Propeller-agitated Chests —Blending—Storage
- Screen Rooms and Deckers
- Semi-chemical Fibre Washers and Bleachers

. . . AND MORE

Let us work with you

IMPCO

Improved PAPER MACHINERY CORPORATION

NASHUA, NEW HAMPSHIRE

Are you sinking good money in too-heavy pipe?

IF VERIFIED, this will be the only case in history of heavy pipe sinking a sizable ship, *but* . . . industry sinks a lot of money every year in pipe heavier than necessary for the plain, every-day services like those listed below.

Look at this list. Note that it covers the kind of applications for which Standard Thickness pipe is customarily used. And yet it has been conclusively proved in hundreds of plants that light-but-strong Taylor Spiral Pipe can handle jobs of this kind with strength and service life to spare.

Such plants have simply gotten away from the old tradition of using Standard Thickness pipe for everything that doesn't call for still heavier pipe. And by so doing they have in many cases cut the installed cost of piping squarely in half.

Taylor Spiral does the work of heavier pipe because its spiral construction gives it remarkable strength in proportion to its weight. As a matter of fact, the spiral seam, running from end to end, gives it greater bursting strength, greater collapsing strength, greater longitudinal stiffness than even seamless pipe of equal gauge.

Switching to Taylor Spiral Pipe for services like those listed is made easy by the complete range of sizes and wide variety of fittings. Thicknesses range from 12 to 8 gauge; sizes from 6" to 42"; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies are produced by Taylor Forge & Pipe Works, assuring complete service and undivided responsibility.

TAYLOR FORGE & PIPE WORKS

General Offices & Works: Chicago, P. O. Box 485 ★ New York Office: 50 Church St. ★ Philadelphia Office: Broad Street Station Bldg.

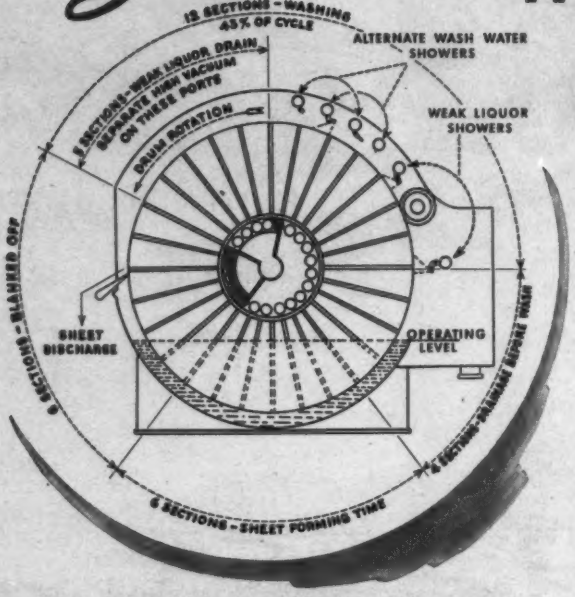
CHANGE TO TAYLOR SPIRAL PIPE FOR:

- High and Low Pressure Water Lines
- Low Pressure Steam and Air Lines
- Steam and Diesel Exhaust Lines
- Vacuum and Suction Lines
- Blower Piping
- White Water Lines
- Pulp Stock Lines
- Paper Stock Lines
- Alkaline Lines
- Size Lines
- Swing Pipe
- Spray Pond Piping

With Victory ~ planes and ships returning home—every American industry that has had a part in war production will have the deep satisfaction of having done a stupendous job well. We, who have turned our facilities into the making of essential war matériel, have learned lessons—have gained new and valuable ideas that will enable us to give greater services in the designing and building advanced finishing machinery for the great paper industry.

B. F. PERKINS & SON, Inc.
ENGINEERS AND MANUFACTURERS
HOLYOKE, MASS.

Look into the ADVANTAGES OF THE SWENSON-NYMAN Pulp Washer


12 SECTIONS - WASHING 45% OF CYCLE
ALTERNATE WASH WATER SHOWERS
8 SECTIONS - WEAK LIQUOR DRAIN SEPARATE HIGH VACUUM ON THESE PORTS
DRUM ROTATION
WEAK LIQUOR SHOWERS
SHEET DISCHARGE
OPERATING LEVEL
6 SECTIONS - BLANKET OFF
6 SECTIONS - BLANKET BEFORE WASH
6 SECTIONS - SHEET FORMING TIME

The diagram above shows the function of each of the 28 sections in the Swenson-Nyman washer, and indicates the pertinent features and operating principle.

This combination of features is found only in the Swenson-Nyman washer: Two-stage countercurrent washing on a single drum—separate handling of strong and weak liquors—independently controlled vacuum on each stage with uniform distribution across the entire sheet at all times—pulp pickup at low level—washing area twice as large as the sheet forming area—low point sheet discharge—no backwashing.

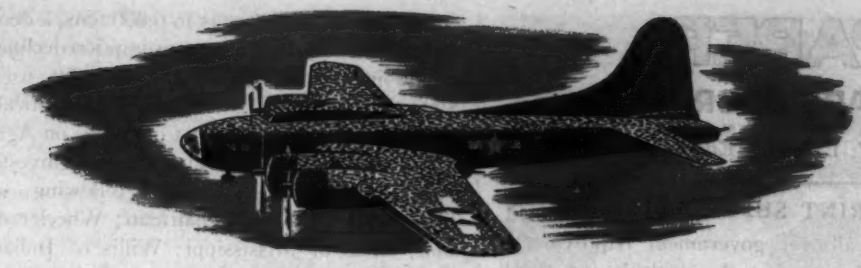
Swenson-Nyman washers for kraft, sulfite, and soda pulp mills are made in capacities up to 200 tons per 24 hours. The size best suited for the work to be done is determined by Swenson Engineers after an analysis of each mill's requirements. For complete information write for Bulletin No. F-104.

Newly completed Swenson-Nyman washer—now in operation.

Black Liquor Evaporators • Lime Sludge Filters • Pulp Washers • Causticizers • Digester Blow Condenser Heat Recovery Systems.

SWENSON

SWENSON EVAPORATOR COMPANY
Division of Whiting Corporation
15687 Lathrop Avenue, Harvey, Ill.



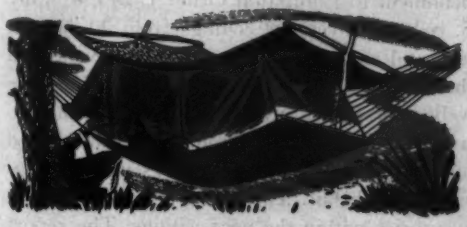
How "Robbing Peter to Pay Paul" Lifted the Bomber Ceiling

Many times it has been a case of robbing Peter to pay Paul, borrowing materials and labor from one department to pinch hit in another where military demands were urgent.

Naturally, this has made it impossible for us to fill as promptly as we would like many of our normal orders for dyes, pigments and other products.

For example, at one time our entire operation of some important sulfur colors was shut down to make way for the production of melamine, the remarkable new chemical that, through its use in plastic parts for ignition systems, has been an important factor in lifting bomber ceilings from 18,000 feet to above 40,000 feet.

Calco's production of melamine increased from only 400,000 pounds in 1940 to millions of pounds in 1944. It has been physically impossible to meet such tremendous increases and continue always to supply our customers as in normal times.



Putting first things first has developed into a tremendous wartime job at Calco. It is work of which we are proud—and in which we ask your understanding. You may be sure that everything is being done to meet your requirements—with all the extra time, labor and effort we can muster.

Heller & Merz Department

CALCO CHEMICAL DIVISION • AMERICAN CYANAMID COMPANY

Bound Brook, New Jersey

New York • Chicago • Philadelphia • Boston • Charlotte • Providence

PAPER
TRADE JOURNAL
Reg. U. S. Pat. Off.
W. L. Cook, Editor

NEWSPRINT SUPPLY TIGHT

Newsprint for all-over government requirements is so extremely heavy that the outlook for third quarter civilian supply appears little improved at this date. The only relief expected is a possible reduction in government demands. In commenting on the situation, the latest report of the Department of Commerce states that consumption of newsprint by United States publishers during the third quarter will be at the same level as during the first half of 1945. In order to maintain this rate of consumption, however, it will again be necessary to dip into publishers' inventories, since the increased amount promised by Canada is insufficient to offset the excess of orders which have accumulated at the mills.

In an attempt to balance the situation more favorably, amendment to Limitation Order L-240, of May 31, 1945, reduced inventory ceilings from 40 days in the eastern and northern areas, and from 65 days in the southern and Pacific areas, to 30 days and 50 days respectively. These new inventory ceilings went into effect on June 30, 1945. This action will permit United States publishers to maintain their present consumption quotas in full, but deliveries will be reduced to bring inventories within the new ceilings. The report further states that the present tight situation in newsprint promises to continue through the third quarter. Canadian newsprint authorities have announced that beginning July 1, 1945, Canada will supply the United States with 215,000 tons monthly. This is an increase of 15,000 tons monthly over the previous rate, but will be insufficient to offset the present excess of 50,000 tons of deferred orders. Deferred orders have accumulated as government agencies have exceeded the available supply. Orders on Canadian mills from the Army, the Foreign Economic Administration and other agencies, total about 20,000 tons monthly. While this heavy demand on American newsprint mills continues, there appears little prospect of any material improvement in the supply situation in the third quarter from that in the first two quarters of 1945.

Newsprint production in the United States in the first four months of 1945 aggregated 243,000 tons, compared with 231,000 tons in the like period in 1944. Imports totaled 776,000 tons, compared with 752,000 tons in 1944, and exports totaled 14,000 tons, compared with 12,000 tons in 1944. Comparing the first four months of 1945 with 1944, production increased 5.1%; imports, 3.1%; exports, 14.7% and the total supply rose 3.7%. Inventories for the stated period decreased from 324,000 tons to 298,000 tons, or 8.1%; publishers stocks declined from 316,000 tons to 292,000 tons, a decrease of 7.6%, while stocks at the mills decreased from 8,000 tons to 6,000 tons, a decrease of 26.3%. The apparent total consumption declined 1.8%.

The inadequate supply of newsprint for United States consumption is considered so critical that a subcommittee of the Senate Committee on Agriculture and Forestry has been appointed to investigate it. The committee includes the following senators: Thomas of Oklahoma, chairman; Wheeler of Montana; Bilbo of Mississippi; Willis of Indiana; and Butler of Nebraska. It is reported that the findings of the Boren Committee of the House of Representatives will be carefully studied before the new group undertakes its investigations.

WHOLESALE SALES AND STOCKS DOWN

In reporting on wholesalers' sales and inventories the Department of Commerce points out that wholesalers' sales of paper and paper products declined seasonally 4% in April from March. The report goes on to say that the influence on the seasonal movement of sales during the war is well illustrated by the divergence of war and peacetime monthly changes. From 1939 to 1942 April sales were always above March sales by about 8%. Beginning in 1942 and throughout the following years, April sales have always shown a decline from March of from 1 to 12%. Such inconsistencies in monthly sales movements measure and point out in a rough way some of the difficulties the trade has faced during the war period.

Wholesalers' inventories, the Department reports, declined from November, 1944, by 6% in December, 1944; 3% in January and February, 1945; 2% in March, and 1% in April of this year. Whether this downward trend is about to end is difficult to state, as it is dependent upon several major factors. There is, however, the reports state, no basis as yet for becoming optimistic. The war effort still requires great quantities of pulp and paper and until a sizeable amount of current paper production is available for civilian use, the wholesaler as well as other consumers cannot expect to rebuild their inventories back to what they consider a normal basis.

For Honorable Service

The Army, the Navy and the Rehabilitation and Reemployment Administration feel that it is highly important that all the people become familiar with the honorable discharge emblem awarded to veterans of the present war. They are appealing to advertisers, advertising agents and all those who in any manner reach the public, to display prominently the emblem with the statement: "This stands for honorable service to our Country." It is urged that reproductions of the emblem be used in advertising. Permission is granted to reproduce the emblem in any size desired.

Newsprint Output Up in June

Newsprint production in Canada during June 1945 amounted to 266,417 tons and shipments to 258,348 tons. Production in the United States was 60,828 tons and shipments were 56,492 tons. The output in Newfoundland was 27,875 tons and shipments were 40,175 tons making a total North American production of 355,120 tons and shipments of 355,015 tons. Total production in June 1944 was 330,005 tons and shipments were 359,885 tons.

The Canadian mills produced 64,074 tons more in the first six months of 1945 than in the first six months of 1944, which was an increase of 4.3 percent. The output in the United States was 15,637 tons or 4.4 percent more than in the first six months of 1944; in Newfoundland production was 36,444 tons or 28.7 percent more, making a total increase of 116,155 tons, or 5.9 percent more than in the first six months of 1944.

Stocks of newsprint paper at the end of June were 97,722 tons at Canadian mills, 10,739 tons at United States mills, and 55,415 tons at Newfoundland mills, making a combined total of 163,876 tons compared with 163,771 tons on May 31, 1945, and 130,956 tons at the end of June 1944.

Midland Paper Buys Zellerbach Division

CHICAGO, July 18, 1945—We believe that this publication is first with the news that Chicago interests have purchased the Midland Division of the Zellerbach Paper Company and will operate the organization as the Midland Paper Company. No other details are available now except the major news that C. G. Foster, for thirty years a top executive of the J. W. Butler Paper Company, will serve as its president. The names of other purchasers were not ready for announcement at this writing. The Midland Division has long been an effective Zellerbach outlet here and its past reputation when coupled with the known ability of Mr. Foster augurs well for a successful independently owned operation in this area.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
June 2	87.9	June 3	86.1
June 9	92.8	June 10	90.7
June 16	91.5	June 17	91.5
June 23	90.4	June 24	90.8
June 30	87.5	July 1	86.2
July 7	52.7	July 8	50.9

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	90.6	82.4	88.1
1945	86.7	89.4	90.2	88.1	89.8	91.2							

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to Date	67.1	78.6	86.6	92.8	96.8	87.5	87.2	87.9
Year Average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

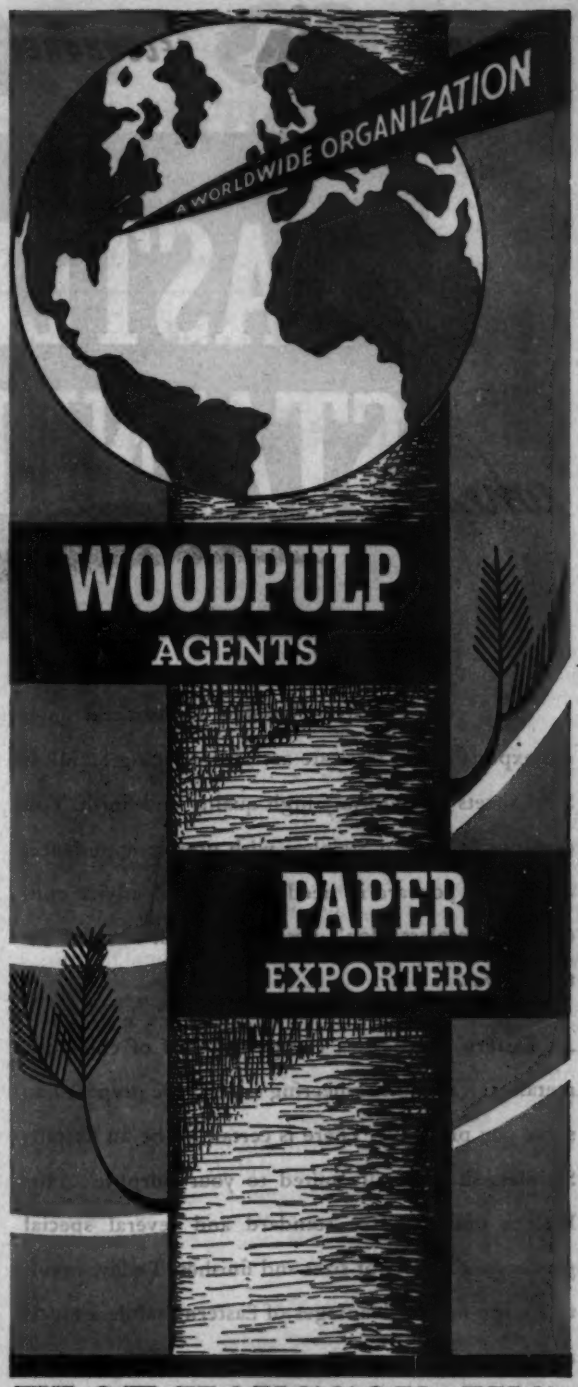
* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1945		Corresponding Weeks—1944	
June 2	93	June 3	93
June 9	97	June 10	96
June 16	96	June 17	95
June 23	96	June 24	96
June 30	96	July 1	93
July 7	62	July 8	60

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	91	95	97	97	96	96							

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.



ask EASTERN for the answer when STAINLESS is the question

Specialists in Stainless, Eastern craftsmen are experts in the intricate art of producing Stainless Steel sheets of uniformly high quality and finish. You can specify Eastern Stainless with utmost confidence. And when you are in need of technical advice concerning Stainless, don't hesitate . . . Ask Eastern for the answer.

At Eastern Stainless, a competent staff of chemical, metallurgical and engineering experts are prepared to serve you promptly. There is certain to be an Eastern Stainless sheet ideally suited to your purpose . . . for Eastern offers twelve standard and several special grades in a variety of sizes and finishes. Today, investigate the many advantages of Eastern Stainless Steels in your business.

VALUABLE NEW 96-PAGE CATALOG...NOW AVAILABLE

It's a New Encyclopedia on Stainless Steels! Here's the Stainless "answer book"—a 96-page assistant valuable to you in your daily work. Just off the presses, this informative, illustrated volume gives authentic information on modern applications of Stainless Steels in many great industries including your own. Also contains much technical data compiled by Eastern Stainless specialists. Be sure to send for your copy today.

EASTERN STAINLESS STEEL CORPORATION
Baltimore 3, Maryland Dept. 55

Gentlemen: Please send me a free copy of your valuable new 96 page catalog.

Firm Name.....

Address .....

City..... State.....

Your Name and Title .....

EASTERN STAINLESS STEEL CORPORATION

Baltimore 3, Md.

Stainless Sheets Exclusively • Distributors' stock available in most areas

CHICAGO • CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • PHILADELPHIA

Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Relative Toxicity of Disinfectants Recommended for Use in the Paper Industry*

II. Inhibiting Concentrations for *Bacillus mycoides* and *Aspergillus niger*

By John W. Appling[1] and John F. McCoy[2]

Abstract

The need for evaluating disinfectants recommended for use in the paper industry is being met by maintaining an active testing program at The Institute of Paper Chemistry under the sponsorship of the Biological Control Committee of the American Paper and Pulp Association. While various methods have been used for this purpose, the authors have found the Petri plate method to be entirely satisfactory for determining inhibiting concentrations of water-soluble disinfectants. Ten commercially available disinfectants have been tested against each of three test organisms: Aerobacter aerogenes, Bacillus mycoides, and Aspergillus niger. The technique used is described in this and the preceding paper. Tabulated data show marked difference among the ten disinfectants and among the test organisms. The organic mercurial compounds tested were more toxic for each test organism than the chlorinated phenolic compounds. Larger concentrations of both groups were required to inhibit Aerobacter aerogenes than were required to inhibit the other two test organisms. The ten materials are compared in three ways: (a) on the basis of toxicity toward each test organism; (b) on the basis of the cost per pound of disinfectant; and (c) on the basis of cost and toxicity considered jointly. The need for establishing a standard disinfectant, which will be accepted by all testing laboratories for checking technique and resistance of the test organisms, is most urgent. Cost-toxicity data can be applied most successfully to specific microbiological problems in the mill when the types of microorganisms involved are known. Mildew control and moldproofing should be closely related to the data obtained with the fungus (mold) Aspergillus niger. The use of cost-toxicity data for slime control is more difficult; however, these data will be applicable if the predominant types of microorganisms are known. The evaluation program is being continued to test other disinfectants recommended for use in the paper industry.

[1] Member TAPPI; Research Associate, The Institute of Paper Chemistry, Appleton, Wis.
[2] Technical Assistant, The Institute of Paper Chemistry, Appleton, Wis.

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

Although there are many disinfectants on the market for use in the paper industry, there are not many data in the literature to show how these various materials compare with one another. Appling and Shema *(1)* reported laboratory data for inhibiting and killing concentrations as determined by the Petri plate and the flask methods for a number of commercially available disinfectants, many of which are recommended by their respective manufacturers for slime control in paper mills. King *(2)* reported the results of laboratory and mill tests with a large number of chemical disinfectants. These results were based upon the ability of the materials tested to inhibit and to kill the microorganisms which were present in the paper-machine white water of a particular mill. Sanborn *(3)* reported killing concentrations as determined by a modification of the phenol coefficient technique for a number of chlorinated phenolic compounds recommended for slime control. There are numerous instances of mill performance data which are very illuminating in some ways but which usually do not involve the use of more than a few chemical disinfectants. Comparative data have undoubtedly been obtained by the various manufacturers of disinfectants but these are not generally available except for emphasizing the merits of a particular product.

Choice of a Testing Technique

A standard testing technique or method for the evaluation of disinfectants recommended for use in the paper industry does not exist. The need for such a method becomes apparent when it is desired to compare results from different laboratories. As a matter of fact each of the three literature citations above describe the evaluation of disinfectants by four different methods. The results can only be confusing to those interested in the practical application of disinfectants in the paper industry.

During the past forty years a vast amount of work has been done using phenol as a standard for evaluating disinfectants. In 1931 the United States Food and Drug Administration method *(4)* for determining phenol coefficients became official for evaluating disinfectants in this country. Without going into details, it can be stated that the phenol coefficient is merely

a numerical result which expresses the killing effect of a disinfectant compared with phenol when tested under closely prescribed conditions. Although there still is considerable disagreement among bacteriologists concerning the suitability of phenol as a standard, the method is generally used for the evaluation of disinfectants for the food and drug industries. Prescott and Dunn *(5)* give an excellent discussion of disinfectants and their evaluation from the viewpoint of the industrial microbiologist.

The vast amount of work done in developing methods for the evaluation of disinfectants in various fields indicates that a critical approach should be made to their evaluation for the paper industry. Does microbiological control in the mill by the use of disinfectants require that these materials kill all the microorganisms and obtain absolute sterility in the mill system and in the paper produced? If this is the desired goal, then the choice of a testing method should be guided by the experience of those working in the food and drug industry. The official phenol coefficient method would be indicated as a logical choice. Sanborn *(3)* used a modification of this method because he believed that the slime-forming microorganisms had to be killed in order to control slime. Appling and Shema *(1)* developed a method by which the killing concentrations of a disinfectant were determined for various exposure times.

However, if the desired goal is to inhibit the multiplication and growth of microorganisms in the mill system, then the choice of a method for evaluating disinfectants should be one which gives the inhibiting concentration. In the case of some disinfectants and some bacteria, there may be no significant difference between the killing and the inhibiting concentrations; however, large differences usually exist between these values. In pulp and paper mill systems, it is often impractical and uneconomical to maintain killing concentrations of disinfectants; hence, there is greater interest in the knowledge and application of the inhibiting concentrations. It should be emphasized that bacteria can withstand inhibiting concentrations and, if the dosage is lowered for sufficient time, these same bacteria will soon attain normal growth and multiplication. There is great need of maintaining the required inhibiting concentration, which probably is purposely exceeded by an arbitrary safety margin in some mills in order to insure proper microbiological control.

The Petri plate method has been used extensively by the authors to determine the inhibiting concentrations of many disinfectants. In order to apply this method to a material of unknown toxicity, it is necessary to initiate a range-finding series of concentrations in nutrient agar. The latter varies from 0.002 to 0.02% in increments of 0.002%. When the inhibiting concentration is found to be greater than 0.02%, a second series varying from 0.02 to 0.2% in increments of 0.02% is prepared. If the inhibiting concentration is greater than 0.2%, it is reported as such. On the other hand if the range-finding series indicates an inhibiting concentration less than 0.002%, the procedure is to prepare descending series until the value is determined. The series used and the increments for each are as follows:

(a) 0.0002—0.0020% (increment of 0.0002%)
(b) 0.00002—0.0002% (increment of 0.00002%)
(c) 0.000005—0.00002% (increment of 0.000005%)

The details for preparing the agar-disinfectant mixtures, for streaking the plates with one test organism, for incubation, and for observation were given in the preceding paper *(6)*. Some details differed from one test organism to another and these will be given in this paper.

The results which are being reported at this time are based on laboratory work at The Institute of Paper Chemistry under the sponsorship of the Biological Control Committee of the American Paper and Pulp Association. The inhibiting concentrations of ten commercial disinfectants have been determined for the test organisms *Aerobacter aerogenes, Bacillus mycoides,* and *Aspergillus niger.* The first was selected as a representative species of nonspore-forming bacteria which are frequently found in paper-mill slimes. The culture used was originally obtained from the University of California and is now maintained in the culture collection of the Institute. The second was selected as a representative species of aerobic spore-forming bacteria which are found in paper samples. This culture, which was isolated from a paperboard sample, was found by Appling and Shema *(7)* to be very heat resistant. The third and last was selected as a representative species of the fungi commonly designated as molds.

The testing technique and the resulting data for *Aerobacter aerogenes* have been given in the preceding paper *(6)*. Some of these data will be repeated for comparative purposes in the present paper. Most of the technique described was directly applicable to the work with *Bacillus mycoides* and *Aspergillus niger.* In the case of the former, 4-day old cultures were used to prepare the water suspensions for streaking the plates. Most of the ten disinfectants were tested against spore suspensions — that is, the water suspension was heated 10 minutes at 80±0.5° C. to kill all vegetative cells. Some of the disinfectants were also tested against a mixture of vegetative cells and spores. There was no significant difference between these suspensions. The incubation period was 48 hours at 37°C. for *Bacillus mycoides.* As in the case of *Aerobacter aerogenes,* each run was repeated at least once and each plate consisted of two streakings.

In the case of the fungus *Aspergillus niger,* the testing technique differed from that used for the two bacterial species in several ways. Malt agar replaced Bacto nutrient agar. The inoculum was a spore suspension prepared by transferring to a bottle containing 50 ml. of sterile water and glass beads several portions of sporangia from a 7-day old malt agar tube slant of the test organism. When shaken vigorously for several minutes, the suspension became slightly dark colored. The plates were prepared to contain known amounts of the disinfectant and malt agar. Instead of streaking the plates, a loopful (3-mm. loop) of suspension was placed at each of two diametrically opposite spots on the malt agar surface. The plates were incubated at 30°C. for 1 week before examining them for growth (at a magnification of 20x when in doubt). Here, again, each run was repeated at least once.

Ten chemical disinfectants have been tested against each of the three test organisms in the manner already described. The results obtained with *Aerobacter aerogenes* appeared in the previous paper *(6)*. Those obtained with *Bacillus mycoides* and *Aspergillus niger* have been summarized in Tables I and II. The trade names of the materials rather than the chemical composition have been used. In most cases, however, the respective manufacturers have no objection to giving the chemical composition to anyone interested. The materials have been tested as furnished by the

manufacturer and the inhibiting concentrations have been reported on this basis. Thus, the manufacturers of Lignasan give the analysis of this material in terms of the active ingredient, ethyl mercury phosphate. The toxicity data have been reported on the basis of the product Lignasan and not on the basis of ethyl mercury phosphate. More than two test runs were made in many cases; however, only the data from the last two test runs are given in Tables I and II.

In order to compare the disinfectants tested for their ability to inhibit the growth of each of the three test organisms under otherwise optimum conditions of growth, the average values for the inhibiting concentrations were calculated from Tables I and II. These values and those previously reported for *Aerobacter aerogenes* are given in Table III. The inhibiting concentrations have been given on the percentage basis and in parts per million. The latter has the advantages of being more familiar to some technicians and of providing an easy means of comparing the disinfectants on a cost-toxicity basis.

The three test organisms varied considerably in their resistance to the disinfectants tested. The most resistant one was the nonspore-former *Aerobacter aerogenes*, whereas the least resistant was the spore-former *Bacillus mycoides*. Two main groups of disinfectants are well represented in Tables I-IV: (1) the chlorinated phenolic compounds, such as the Nalco products, Permatox 1-S, and Santobrite; and (2) the organic mercurial compounds, such as Lignasan, Merfenel, Permatox 1-S, and P.M. 32 Powder (Permatox 1-S contains an organic mercurial and a chlorinated phenol). The latter group is generally more toxic than the former; however, the test organisms behaved differently toward the various members of the groups. The chlorinated phenolic compounds proved to be much more toxic for the spore-former *Bacillus mycoides* than for either of the other two test organisms. This fact and the marked general toxicity of organic mercurials have been utilized very effectively by at least one manufacturer of disinfectants. Undoubtedly, as more toxicity data are obtained, better use will be made of them in compounding more generally effective disinfectants.

The average price per pound of disinfectant has been furnished by its manufacturer. The data in the first column of Table IV were taken from the previous paper *(6)*. When the inhibiting concentration is expressed in parts per million (Table III), it is evident that any convenient unit of weight may be used. Since the prices quoted were based on the weight in pounds, it should be of interest to calculate

TABLE I.—INHIBITING CONCENTRATIONS OF VARIOUS DISINFECTANTS FOR BACILLUS MYCOIDES AS DETERMINED BY THE PETRI PLATE METHOD

Trade Name of Disinfectant	Range of Concentration Tested, %	Increment Used in Range, %	Inhibiting Concentration	
			Streak 1	Streak 2
1. Lignasan	0.00002 —0.0002	0.00002	0.00016	0.00014
	0.00002 —0.0002	0.00002	0.00016	0.00016
2. Merfenel	0.000005—0.000020	0.000005	0.00001	0.00001
	0.000005—0.000015	0.000005	0.00001	0.00001
3. Nalco 21	0.0004 —0.0012	0.0002	0.0008	0.0008
	0.0004 —0.0012	0.0002	0.0008	0.0008
4. Nalco 21-B ...	0.0002 —0.0020	0.0002	0.0014	0.0014
	.0002 —0.0020	0.0002	0.0014	0.0014
5. Nalco 21-M ...	0.0002 —0.0020	0.0002	0.0006	0.0006
	0.0002 —0.0020	0.0002	0.0006	0.0006
6. Nalco 23	0.0002 —0.0020	0.0002	0.0010	0.0010
	0.0002 —0.0020	0.0002	0.0010	0.0010
7. Penetox	0.0014 —0.0030	0.0002	0.0030	0.0030
	0.0024 —0.0034	0.0002	0.0034	0.0030
8. Permatox 1-S..	0.00002 —0.0002	0.00002	0.00018	0.00018
	0.00002 —0.0002	0.00002	0.00016	0.00016
9. P.M. 32 Powder	0.00002 —0.0002	0.00002	0.00014	0.00014
	0.00002 —0.0002	0.00002	0.00014	0.00014
10. Santobrite	0.0001 —0.0005	0.0001	0.0003	0.0003
	0.0001 —0.0005	0.0001	0.0004	0.0004

TABLE II.—INHIBITING CONCENTRATIONS OF VARIOUS DISINFECTANTS FOR ASPERGILLUS NIGER AS DETERMINED BY THE PETRI PLATE METHOD

Trade Name of Disinfectant	Range of Concentration Tested, %	Increment Used in Range, %	Inhibiting Concentration	
			Spot 1	Spot 2
1. Lignasan	0.0002 —0.0020	0.0002	0.0006	0.0006
	0.0002 —0.0020	0.0002	0.0006	0.0008
2. Merfenel	0.00005 —0.0005	0.00005	0.0001	0.0001
	0.00005 —0.0002	0.00005	0.0001	0.0001
3. Nalco 21	0.0020 —0.0200	0.0020	0.0120	0.0120
	0.0020 —0.0200	0.0020	0.0120	0.0120
4. Nalco 21-B ..	0.0020 —0.0200	0.0020	0.0040	0.0040
	0.0020 —0.0080	0.0020	0.0040	0.0040
5. Nalco 21-M ..	0.0002 —0.0020	0.0002	0.0018	0.0018
	0.0016 —0.0026	0.0002	0.0018	0.0020
6. Nalco 23	0.0002 —0.0020	0.0002	0.0020	0.0018
	0.0016 —0.0026	0.0002	0.0020	0.0022
7. Penetox	0.0200 —0.2000	0.0200	0.0400	0.0400
	0.0200 —0.2000	0.0200	0.0400	0.0400
8. Permatox 1-S..	0.0002 —0.0020	0.0002	0.0016	0.0016
	0.0002 —0.0020	0.0002	0.0018	0.0016
9. P.M. 32 Powder	0.0012 —0.0040	0.0004	0.0016	0.0016
	0.0012 —0.0040	0.0004	0.0016	0.0016
10. Santobrite	0.0002 —0.0020	0.0002	0.0016	0.0016
	0.0002 —0.0020	0.0002	0.0016	0.0016

the cost in terms of the inhibiting concentration or toxicity, e.g., the inhibiting concentration of Lignasan for *Aerobacter aerogenes* is 10 pounds per million pounds to be treated. The cost of treating 1 million pounds would be 10 × $0.48 or $4.80. However, if the inhibiting concentration of Lignasan for *Bacillus mycoides* were used, the cost per million pounds would be 1.6 × $0.48 or $0.77. The cost-toxicity data for each of the ten disinfectants studied thus far against each of the three test organisms have been calculated and are given in Table IV. It is obvious from the toxicity data that the three test organisms vary considerably in their resistance to the various disinfectants. Consequently, the cost of treating 1 million pounds of water, pulp suspension, or other material will depend not only upon the price per pound of disinfectant but also upon the types of organisms to be inhibited.

Application of Cost-Toxicity Data to Mill Problems

The data presented in this paper show the futility of selecting a disinfectant solely upon a cost basis. However, it would be uneconomical to disregard cost and to select a disinfectant solely upon a toxicity basis. It is believed that the most effective and economical use of disinfectants can be made by the use of cost-toxicity data, although the authors recognize the possibility of a given disinfectant being more or less toxic in a mill system than in agar media such as were used.

The application of cost-toxicity data presupposes a knowledge of the types of organisms to be inhibited. Moldproofing paper and pulp is a good illustration for the application of such data. One of the three test

TABLE III.—COMPARISON OF INHIBITING CONCENTRATIONS FOR THREE TEST ORGANISMS

Trade Name of Disinfectant	Inhibiting Concentration % by Weight (Average)* for			Inhibiting Concentration p.p.m. (Average)* for		
	Aerobacter aerogenes	*Bacillus mycoides*	*Aspergillus niger*	*Aerobacter aerogenes*	*Bacillus mycoides*	*Aspergillus niger*
1. Lignasan	0.0010	0.00016	0.0006	10	1.6	6
2. Merfenel	0.0001	0.00001	0.0001	1	0.1	1
3. Nalco 21	0.0750	0.00080	0.0120	750	8	120
4. Nalco 21-B ...	0.0100	0.00140	0.0040	100	14	40
5. Nalco 21-M ...	0.0400	0.00060	0.0018	400	6	18
6. Nalco 23	0.0450	0.00100	0.0020	450	10	20
7. Penetox	0.0500	0.00300	0.0400	500	30	400
8. Permatox 1-S ..	0.0035	0.00018	0.0016	35	1.8	16
9. P.M. 32 Powder	0.0014	0.00014	0.0016	14	1.4	16
10. Santobrite	0.0225	0.00040	0.0016	225	4	16

* Average made on basis of increments used in each case.

organisms, *Aspergillus niger*, is a mold which is commonly found on moldy paper and pulp. Table III gives the inhibiting concentrations of each disinfectant for this mold. When these toxicity data are combined with the cost data in Table IV, the cost-toxicity data for *Aspergillus niger* result. Upon examining the values in the last column of Table IV, it is relatively easy to make effective choices for specific cases of moldproofing.

Slime control is another example to which cost-toxicity data may be applied. Slimes differ considerably in composition and appearance. A knowledge of the principal types of organisms in a particular slime becomes necessary in the light of the cost-toxicity data. The dosage and the cost will be dependent upon the types to be inhibited. Since the cost-toxicity data (Table IV) show that *Bacillus mycoides* (a spore-former) can be inhibited most economically, it would appear that bacterial slimes which contain chiefly spore-formers should require smaller dosages than bacterial slimes which contain chiefly nonspore-formers, such as *Aerobacter aerogenes*. The problem of slime control is unfortunately more complicated than the simple cases just described. One, two, or all three types represented by the three test organisms may be present in paper-mill slime. The important point to note here is that the types of organisms present in the fresh slime as it is found in the mill must be determined if the cost-toxicity data are to be applied most effectively. Obviously, this solution is not an easy one, even for an experienced microbiologist. An alternative has been suggested elsewhere in this paper—namely, the development of a disinfectant which will be sufficiently toxic to every type of microorganism that it will effectively control every type of slime. While attempts have been and continue to be made in this direction, no such material is known to the authors.

The authors have already called attention to four different methods which are in use for evaluating disinfectants recommended for the paper industry. The manufacturers of these materials for other industries have recognized the need for a yardstick to evaluate their products. Agreement upon a standard method will necessitate cooperation on the part of all concerned.

Not long ago the authors were confronted with a problem which illustrates the importance of a standard disinfectant. Another testing laboratory disagreed with the published results for the inhibiting concentration of Merfenel for *Aerobacter aerogenes (6)*. They did not confirm the inhibiting concentration of Merfenel; however, they did confirm that of their product. The divergence in results on Merfenel may have been due to one of several reasons: (a) the test organisms differed in resistance; (b) the Merfenel samples may have differed in toxicity and solubility; (c) the two laboratories may have used different testing techniques. Of these three possibilities, (c) is eliminated because both laboratories used the same testing method; (a) is probably eliminated because, although the test organisms were not identical strains, they behaved very similarly toward the manufacturer's own product. Therefore, it would appear that the discrepancy in results must be due to a possible difference in the samples of Merfenel which were tested. The two samples are being checked by both laboratories. If a standard disinfectant had been available, the laboratories would have checked the resistance of their test organisms against this standard and, in so doing, would have discovered any difference in the test organisms or in the technique used. If differences were found, their sources would naturally be ascertained before attempting to evaluate new materials.

TABLE IV.—COST-TOXICITY DATA

Trade Name of Disinfectant	Average Price* Per Pound	(Inhibiting Concentration in p.p.m.) × (Average Price per Pound)		
		Aerobacter aerogenes	*Bacillus mycoides*	*Aspergillus niger*
1. Lignasan	$0.48	$4.80	$0.77	$2.88
2. Merfenel	11.20	11.20	1.12	11.20
3. Nalco 21	0.13	97.50	1.01	15.60
4. Nalco 21-B	0.165	16.50	2.31	6.60
5. Nalco 21-M	0.19	76.00	1.14	3.42
6. Nalco 23	0.165	74.25	1.65	3.30
7. Penetox	0.20	100.00	6.00	80.00
8. Permatox 1-S	0.50	17.50	0.90	8.00
9. P.M. 32 Powder	0.80	11.20	1.12	12.80
10. Santobrite	0.15	33.75	0.60	2.40

* It must be understood that these data are only representative and in nearly every case the price will depend upon the consumption of the disinfectant. The paper or pulp mill should consult directly with the manufacturer whose name and address were given in the previous paper *(6)*.

The Petri plate method has been thoroughly investigated by the authors, and it has been successfully applied to the determination of the inhibiting concentrations of many materials against various test organisms. The method has given reproducible results in each of two different laboratories, and this is an important characteristic for a proposed standard method. In addition, the Petri plate method lends itself readily to screening tests for selecting the most promising materials for more extensive tests.

A standard method for evaluating disinfectants should specify a means for checking the skill of the technician and the resistance of the test organism. The official phenol coefficient method of the U. S. Food and Drug Administration *(4)* uses a special grade of phenol as its standard. The test organism should survive specified concentrations of phenol and be killed by others within a definite time period. The authors have used Merfenel, a technical grade of phenylmercuric acetate, as a temporary standard since it had the highest degree of purity among the disinfectants tested. A standard disinfectant should be chemically pure, stable under the conditions of its use and storage, and its toxicity should be constant and easy to reproduce. Two materials suggest themselves at the present time—namely, phenol and mercuric chloride (C.P. grades).

The committee is anxious to expand the testing program to include all commercially available disinfectants which are being recommended for use in the paper industry. It is willing to determine the inhibiting concentration of any representative sample which a mill may wish to have examined. There are only a few on hand to be tested at present; therefore, more are desired. It was stated in the first paper that the committee would be glad to include such promising new materials as its testing program permitted. If any manufacturer wishes to submit any new material prior to its release for mill use, he should communicate with the committee.

Literature Cited

1. Appling, J. W., and Shema, B. F., *Paper Mill* 65, no. 35: 14, 16 (Aug. 29, 1942).
2. King, G., *Pacific Pulp Paper Ind.* 18, no. 6: 39-42, 44, 46 (June, 1944).
3. Sanborn, J. R., *Paper Trade J.* 119, no. 25: 37-42 (Dec. 21, 1944).
4. United States Food and Drug Administration, Methods of Testing Antiseptics and Disinfectants. U.S.D.A. Circular No. 198. Dec., 1931. 20 p.
5. Prescott, S. C., and Dunn, C. G. Industrial Microbiology. McGraw-Hill Book Co., 1940, p. 491-500.
6. Appling, J. W., and McCoy, J. F., *Paper Trade J.* 119, no. 11: 116-118 (Sept. 14, 1944).
7. Appling, J. W., and Shema, B. F., *Paper Trade J.* 114, no. 13: 40-44 (March 26, 1942); *Tech. Assoc. Papers* 25: 251-255 (June, 1942).

Ink Coverage—Determination and Relation to Printability*

By Rolf Buchdahl[1] and Margaret F. Polglase[1]

Abstract

Two new methods are described to determine the amount of ink or film thickness of a print on a given area. In one method the amount ink per unit area is obtained by the use of a known amount of dyestuff in the ink which is extracted from the print. The concentration of the dyestuff is determined colorimetrically. In the other method the amount of ink is determined by adding a small quantity of radioactive material to the ink. From a measurement of the radioactive activity of the print the amount of ink can be obtained. The use of such methods for printability evaluations of paper stocks is discussed briefly.

Introduction

The amount of ink on a given print area is a quantity which is of considerable interest to every person working in the field of the graphic arts. The "mileage" of an ink, which is the amount of ink on a given number of impressions, is a property which must be evaluated by every printer particularly in newspaper and magazine printing where large quantities of printing inks are required. As "mileage" is not only a function of the ink but also of the paper, it is also an important technical property to the ink and the papermaker.

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

[1] Research Division, General Printing Ink Corp., New York, N. Y.

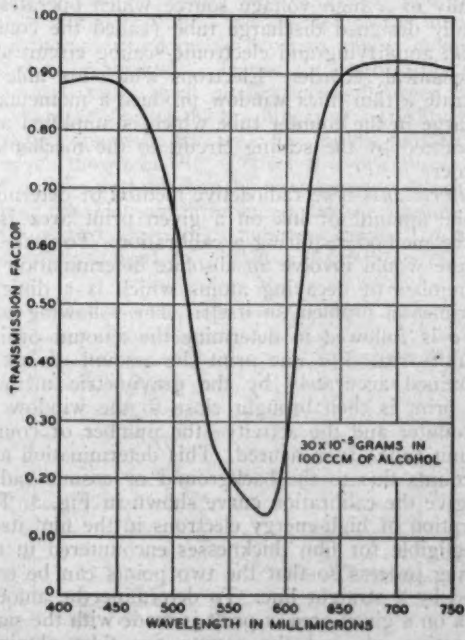


FIG. 1
Absorption Spectrum of Methylviolet Dyestuff in Alcohol

A More Significant Problem

There is another and more significant problem—namely the problem of printability in general—where the amount of ink on a given area plays an important role. Many workers in the field of graphic arts have recognized that some relationship exists between the amount of ink on a print and the quality of this print. However, so far as the authors know, the exact nature of such a relationship has not been established. It is quite clear that the determination of the amount of ink on a series of prints of different quality can not be, in itself, a measure of the quality of a print. The print quality of various prints can differ considerably even though the amount of ink per unit area might be the same for these prints. It will be shown here that there is a relationship between mileage and printability, at least within certain limits. The usefulness of such a relationship to the papermaker and ink maker alike is clear; it might furnish the basis for a simple objective method of evaluating the printing qualities of paper and ink.

Determination of Amount of Ink

There are also other problems where the amount of ink per unit area is important, e.g., the color properties of an ink film are a function of the film thickness or coverage. To study these various problems, appropriate methods must be available to determine rapidly and fairly accurately the amount of ink on a given print area. Within the last three years the two methods here described have been developed in the laboratory.

Based on Use of Tracer Material

Both methods are based on the use of a tracer material. A tracer material is a substance which can easily be detected even if present only in minute quantity. In one method the tracer material is a dyestuff, i.e., methyl violet which is used in a large number of printing inks. In the other method the tracer material is a radioactive compound. In the dyestuff method a known quantity of dyestuff is added to the ink. The dyestuff is extracted from the print and the amount is determined colorimetrically. In the radioactive tracer method a small quantity of radioactive material is added to the ink. The amount of ink on the print is determined by measuring the activity on this print with a Geiger counter.

Dyestuff Method

Because of the high optical absorption coefficient of many dyestuffs it is possible to detect these materials even if present in minute quantities. Figure 1 shows the absorption spectrum of 30 x 10^{-5} grams of methyl violet dyestuff in 100 ml. of alcohol. Figure 2 shows the change of the logarithm of the transmission factor at a given wavelength as a function of the concentration of methyl violet dyestuff in alcohol. It is possible in many cases to extract quantitatively the dyestuff from a print made with an ink containing a known amount of dyestuff. To ascer-

tain the amount of ink, the transmission factor of the extract is determined; from this value and the curve in Fig. 2 the amount of ink on the print is obtained. The following points must be considered to avoid large systematic errors in using this method. (1) The absorption spectrum (or at least that part of the spectrum where the absorption measurements are made) must be the same for the standard and the extracted solution. (2) No materials must be present in the extracted solution which might produce sufficient turbidity to affect the absorption measurements.

Gravimetric Method

The accuracy of this method can be evaluated by comparing results obtained in this manner with results obtained by a gravimetric method. In the gravimetric method the printing plate is weighed before and after the print is made. The printing plate itself consists of a very thin sheet of copper held firmly to a heavy metal base during the printing operation. Table I gives some typical results and indicates the

TABLE I.—AMOUNT OF INK ON A GIVEN PRINT AREA

Dyestuff Method G./sq. in.	Gravimetric Method G./sq. in.
0.00096	0.00100
0.00046	0.00044
0.00046	0.00043
0.00125	0.00124
0.00179	0.00176

agreement between the two methods. The dyestuff method possesses the advantage that it can be used in many cases where the gravimetric method breaks down. The gravimetric method can be employed only with nonvolatile inks and hand operated printing presses. The dyestuff method is not subject to these limitations. However, this method can be used only if it is possible to incorporate a dyestuff into the ink and if it is not necessary to keep a permanent record of the entire print.

Radioactive Tracer Method

The radioactive tracer method is not subject to the difficulties just mentioned. At the same time results are obtained more rapidly by this method than with the dyestuff or gravimetric method. The radioactive method, however, is not an absolute method as are the previously described methods.

Tracers.—The number of artificial radioactive elements has steadily increased during the last two or three decades so that by now almost every element

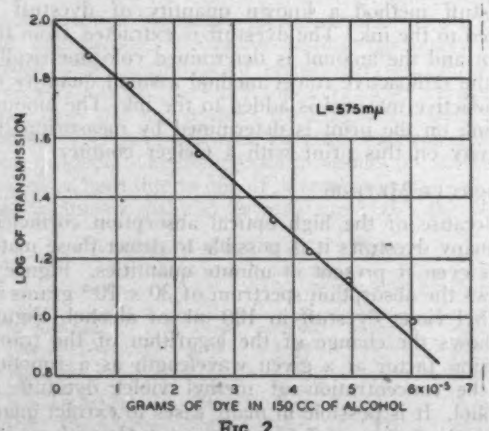


FIG. 2

Log Transmission Factor as a Function of Concentration of Methyl-violet Dyestuff in Alcohol

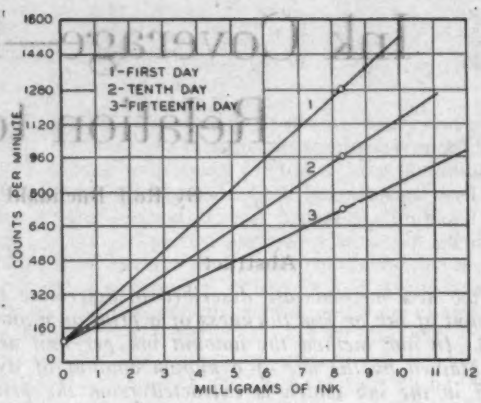


FIG. 3

Calibration Curves for Radioactive Tracer Method

in the periodic table can be made radioactive. A relatively large number of radioactive compounds are available today at reasonable cost. The choice of the proper radioactive element and compound depends on the particular conditions of the experiment under consideration. For this particular problem the radioactive element should have a reasonably long half-life time so that experiment may be effected with the same ink over a period of a few weeks. In our experiments, radioactive phosphorus having a half-life time of 15 days was used. The radioactive compound should be miscible or at least partially soluble in the liquid phase of the ink to obtain uniform distribution of the tracer material throughout the ink. For linseed and most heat-dry varnishes phosphorous pentachloride fulfills these requirements and was used in these experiments.

Instrument.—In the decay of a radioactive element the atoms emit particles, or high energy radiation, or both. The radioactive phosphorous used emits mainly high-energy electrons which can be detected and counted by a Geiger-Müller counter. It consists essentially of a high voltage source which operates a specially designed discharge tube (called the counter), an amplifying and electronic scaling circuit and a mechanical recorder. Electrons which are able to penetrate a thin mica window produce a momentary discharge in the counter tube which is amplified and transmitted by the scaling circuit to the mechanical recorder.

Calibration.—The radioactive method of determining the amount of ink on a given print area is a relative method requiring a calibration. To make it absolute would involve an absolute determination of the number of decaying atoms which is a difficult experimental problem in itself. The following procedure is followed to determine the amount of ink per unit area. For one print the amount of ink is determined accurately by the gravimetric method. This print is then brought close to the window of the counter and the activity—the number of counts per unit time—is measured. This determination and the counts due to the background or cosmic radiation give the calibration curve shown in Fig. 3. The absorption of high-energy electrons in the film itself is negligible for film thicknesses encountered in the printing process so that the two points can be connected by a straight line. To determine the amount of ink on a given area, a print is made with the same radioactive ink and the counts per time obtained under conditions used in measuring the standard

TABLE II.—INK COVERAGE FOR DIFFERENT PAPER AND INK COMBINATIONS

Type of Paper	Type of Ink	Amount of Ink G./sq. in.
Machine coated I	Black linseed varnish ink	0.0010
Machine coated I	Black heat-dry ink	0.0015
Machine coated II	Black heat-dry ink	0.0016
Machine coated III	Black heat-dry ink	0.0022

print. Using Fig. 3, the amount of ink can be read off immediately from this calibration curve. Because of the decay of the radioactive material the calibration curve changes with time. It is necessary, therefore, to obtain a reading for the standard print whenever an ink determination is made.

It was pointed out that the amount of ink on a given print area is a function of the ink and the paper. Table II shows some results for various inks and papers. All prints were made on a Hacker proof press and the printing procedure was the same throughout. In one case three different machine-coated paper stocks were used, the ink being the same. In the other case the paper was kept constant but two different inks were used. The amount of ink on each print was determined by the radioactive method. The data shown in this table are for prints of satisfactory print quality using these particular paper and ink combinations. It can be seen from these data that different amounts of inks are required to obtain a satisfactory print. This brings up the problem as to the relationship between printability and amount of ink on a given print area.

Brightness Relationship.—Figure 4 shows the relationship between the brightness of a black print and the amount of ink for a given area for six different machine-coated paper stocks. The amount of ink was again determined by the radioactive tracer method, and the brightness was calculated from spectrophotometric reflection curves. All prints were made on a Hacker proof press using the same ink and keeping the printing procedure constant throughout but using different thickness of packing to compensate for differences in thickness and resilience of the various paper stocks. The brightness decreases very rapidly at first with increasing film thickness. The decrease in brightness becomes less marked as the amount of ink increases and finally becomes almost independent of the film thickness. The brightness of a black print of satisfactory print quality varies between 5.0 and 7.5%, 100% being the brightness of a freshly smoked magnesium oxide surface. The middle portion of the curves shown in Fig. 4 cover this brightness range. It will be noticed that the various paper stocks used show considerable difference as to the amount of ink required to cover this brightness range. The amount of ink required to obtain a brightness of 5.0 to

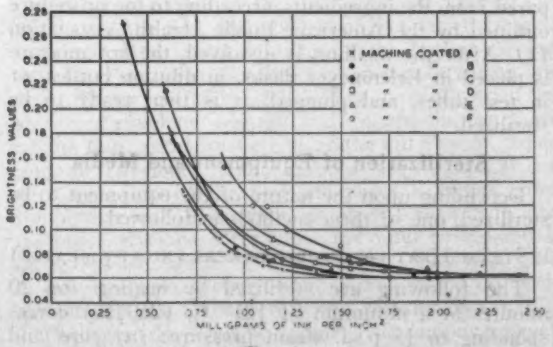


FIG. 4
Print Brightness as a Function of Amount of Ink per Unit Area

TABLE III.—COMPARISON OF PRINT QUALITY WITH AMOUNT OF INK REQUIRED TO GIVE BRIGHTNESS OF 0.070

Paper	Amount of Ink mg./sq. in.	Print Quality *
Machine coated A	1.15	1
Machine coated B	1.28	2
Machine coated C	1.32	3
Machine coated D	1.48	4
Machine coated E	1.70	5
Machine coated F	1.75	6

* 1 indicates best print.

7.5% is shown in column 2 of Table III. Column 3 shows the print quality of the different paper stocks. The print quality was judged subjectively from a half-tone print made on a Hacker proof press using the same ink that was used to determine the relationship between amount of ink and brightness. It will be noticed that a very good correlation exists between the print quality of the different papers and the amount of ink required to obtain the same brightness range for each paper. The poorer the print quality of the sheet the larger is the amount of ink required to obtain a print brightness between 5.0 and 7.5%. It should be emphasized that this relationship was obtained when the same ink was used throughout. Changing the ink might and very often does change the print quality of a print using the same paper.

Print Quality.—The quality of a print depends on a number of factors such as contrast, detail or scale of tone reproduction, finish, and uniformity in the solids and half-tones. The relative importance of each of these factors in forming an over-all judgment and the possibility of evaluating objectively each one of these factors are problems which go beyond the scope of this article, but which the authors hope to deal with in another paper in the near future. It is sufficient to point out here that one of these factors, — namely contrast — is very closely related to the brightness values given previously. Actually the brightness of the unprinted sheet enters into the contrast determination. The correlation shown in Table III implies therefore that other factors determining the quality of a print will contribute to good printability if it is possible to obtain high contrast with a minimum amount of ink per unit area. It is easily understandable that contrast and scale of tones or detail are also closely related. Where more ink is required to obtain high contrast there is a greater possibility of fill-up occurring in the lowlights of a half-tone print which will produce poor reproduction of detail and scale of tones. With respect to the uniformity of a print the relationship is somewhat more complicated. If the nonuniformity is largely because of mottling,—irregular ink distribution over small areas—an increase in the amount of ink usually increases the nonuniformity. However, if the nonuniformity is caused by picking or by marked differences of the paper surface it would not be expected that the difference in the amount of ink for a certain brightness range would be particularly indicative of differences in nonuniformity. Finally, it is clear that differences in the finish or gloss of a series of prints are not related at all to differences in brightness as a function of film thickness.

In conclusion, the method just described to evaluate printability yields satisfactory results if contrast and (to a lesser extent) scale of tones are the important print qualities. Because of the relative speed with which the brightness and the amount of ink can be determined, this method might be used as a control test in the manufacturing of paper.

Bacteriological Examination of Paper and Paperboard*

TAPPI Revised Tentative Standard T 449 m-45

Scope

The following procedures herein are recommended, from the consensus of experienced bacteriologists, for the bacteriological examination of paper and paperboard and represent in every case what may be considered at this time as minimum standard practice. Because of the exacting technique required in bacteriological procedures they can be expected to yield reproducible results only in the hands of properly trained technicians. Likewise, more than usual care must be exercised in the collection and shipment of samples. If possible, this work should be done by a bacteriologist.

Apparatus and Equipment

The following apparatus may be obtained from the usual laboratory supply houses.

1. *Balance.* This should be equipped with a platform of a size to readily accommodate the Petri dishes used. It should be sensitive to 0.1 gram.

2. *Colony Counter.* Any one of several types may be used. The Quebec, the Buck, and the Wolffhuegel colony counters have been found satisfactory. A hand tally for recording the count is recommended.

3. *Containers for Dry Samples.* Two single envelopes, one placed inside the other, are used. The larger one may be 9 by 12 inches and the smaller 6.5 by 9.5 inches. They should be made of heavy kraft paper, tested for ability to withstand breakdown due to embrittlement or charring during sterilization in the hot-air oven. After sterilization, the flap on the outer envelope is secured by Scotch tape.

Another procedure is to make a folder of suitable size from heavy kraft paper and to sterilize it in the oven. After the paper sample has been placed inside the sterile folder, the latter is sealed with Scotch tape.

4. *Cotton.* Rolls of nonabsorbent cotton are used for making plugs.

5. *Dilution Bottles.* 8-oz. narrow-mouthed, square-sectioned glass bottles fitted with crew caps are used for water blanks.

6. *Distintegrators.* These may be either the electrical type, such as the Stevens (Stevens Electric Co., Racine, Wisconsin) and Bersted (Bersted Mfg. Co., Fostoria, Ohio) or the ball-mill type. A kraft paper cover is placed over each disintegrator cup or jar prior to its sterilization by steam heat.

7. *Flaming Equipment.* Depending upon the circumstances, an alcohol lamp, a gasoline blowtorch or a Bunsen burner may be used to flame forceps, scissors, knives, mouths of sterile containers, etc.

8. *Flasks.* 200-ml. Erlenmeyer flasks may be used as containers for sterile media.

9. *Forceps.* These are necessary for handling samples of paper. Each pair is placed in a separate kraft envelope made especially for this purpose, and is then sealed with gummed tape. The unit is then ready to be sterilized. An alternative procedure is to sterilize the forceps by flaming, in which case the envelope is unnecessary.

10. *Incubator.* A reliable incubator which will maintain a temperature of 37 ± 0.5°C. is necessary to provide proper incubation conditions for the inoculated plates and tubes.

11. *Knives.* A paring knife with its blade cut down to within 1.5 inches of the base of the handle is satisfactory. A knife used to cut paperboard is also suitable. In either case the knives are prepared for sterilization as described under (9) Forceps.

12. *Petri Dishes.* Petri dishes, 100 by 15 mm. and preferably of Pyrex glass, are recommended for plating samples. They may be sterilized conveniently in copper boxes fitted with covers.

13. *Pipets.* Two sizes of pipets are used, 1.1-ml. milk-dilution type and 10-ml. ordinary type. Mohr 10-ml. pipets, whose tips have been cut off to give an opening about 3 mm. in diameter at the delivery end, are best for pipetting pulp suspensions. The pipets are placed in metal boxes (preferably copper) to be sterilized.

14. *Scissors.* A satisfactory type has a 4-inch cutting surface. Each pair is prepared for sterilization as described under (9) Forceps.

15. *Sterilizers.* Two types are needed, the particular style and size depending upon the needs of each laboratory:

(a) A steam sterilizer, such as the pressure cooker or the autoclave. When much sterilization is required, the added convenience of a well-regulated modern autoclave will justify the additional expense.

(b) A hot-air oven. For most laboratories, electrically heated ovens are more satisfactory than those heated by gas, but the latter may be used if desired.

In both cases, thermometers are used to determine the inside temperature during sterilization.

Chemicals and Media

A. *Alcohol.* Either methyl alcohol or 95% denatured ethyl alcohol is used to sterilize by flaming.

B. *Standard Nutrient Agar.* Difco dehydrated nutrient agar is recommended. It may also be prepared from the ingredients, according to the procedure outlined by the American Public Health Association *(1)*. After the medium is dissolved, the hot mixture is placed in Erlenmeyer flasks, in dilution bottles, or in test tubes, and plugged. It is then ready to be sterilized.

Sterilization of Equipment and Media

Depending upon the nature of the equipment to be sterilized, one of three methods is followed:

1. STEAM HEAT (PRESSURE COOKERS AND AUTOCLAVES)

The following are sterilized by heating for 20 minutes at a minimum of 121° C. (250°F.) corresponding to 15 p.s.i. steam pressure: *(a)* cups and jars for disintegrators; *(b)* media (unless other con-

* This method has been approved as a tentative standard by the Bacterial Control Methods Committee. Criticisms are earnestly requested and should be sent to R. G. Macdonald, Secretary, Technical Association of the Pulp and Paper Industry, 122 E. 42nd St., New York 17, N. Y. Reprints of this standard may be obtained from the Secretary at 25 cents each.

ditions are specified by the manufacturer of the medium); *(c)* water for dilutions.

2. Dry Heat (electrically or gas-heated ovens)

The following are sterilized by heating for 4 to 5 hours at a minimum temperature of 165°C. (330°F.): *(a)* heavy kraft envelopes and folders; *(b)* forceps; *(c)* knives; *(d)* Petri dishes; *(e)* pipets; *(f)* scissors.

Care must be taken to avoid overheating and consequent scorching of any paper containers or wrappers used on instruments that are being sterilized.

3. Flaming

Scissors, forceps, knives, and similar instruments are alternatively sterilized by flaming. Keep such equipment in denatured 95% alcohol or in methyl alcohol while not in use. When needed for cutting or handling samples, remove the equipment from the liquid, let the alcohol drain off for a few moments, then burn off the excess alcohol in the flaming equipment.

Sampling

1. Frequency of Sampling

It is an axiom in bacteriological control that occasional single samples are inadequate, since the analyses reflect the conditions which prevailed only at the time when such samples were taken. The actual number of samples which should be taken depends largely on the reasons which prompt the analysis.

(a) Sampling of Lots of Paper. At least five representative rolls or skids should be sampled from 50,000-pound lots. For smaller lots, at least three representative samples should be taken.

(b) Sampling Paper on Machines. When a lot of paper is being examined during its manufacture, at least four samples should be taken at 6-hour intervals during each 24 hours. In some cases it may be desirable to sample every 4 hours.

2. Method of Sampling

Two sterile envelopes, one within another, are used for each sample. Every 2 weeks a check should be made on the technique of handling these sterile envelopes by sampling the inner envelopes as if they were paper samples, and testing for bacterial content.

A method which has proved satisfactory for sampling paperboard from rolls is as follows: Make a vertical cut with a sterile knife through several thicknesses on the surface of the roll near the center and parallel to the edge of the roll; a second vertical cut parallel to the first and about 5 inches from the first cut; and a horizontal cut across the bottom of the first two cuts, thus allowing the cut flap to spring out from the surface of the roll. Then carefully open the sterilized envelope, tear off and discard the top sheet of the flap, and slip the end of the cut flap of paper into the envelope. Then make a last horizontal cut across the top of the flap and about 8 inches from the bottom cut. The paper sample will then drop into the inner envelope, after which the outer envelope will be sealed by means of Scotch tape. This will give a sample approximately 5 by 8 inches. Two such samples may be taken at different sections on the roll.

This procedure can be adapted for sampling paper from skids, using flamed forceps for handling the samples of cut paper.

Preparation of Sample

Weighing, plating, and culturing of paper samples should be done in a room which is relatively free of air currents and dust. The surface of the work table should be sponged with a 5% aqueous solution of phenol about a half hour before plating.

A tolerance of ±10% is permitted in the weight of the sample.

1. Dry Samples

(a) Direct Weighing Method. Weigh each sample in a tared, sterile Petri dish placed on the balance. Cut the envelope, in which the sample is received, along the flap by means of a sterile knife or sterile scissors. Open the envelope by pressing the sides, without touching the inner surface, and remove the paper sample with sterile forceps. Hold the sheet of paper in one hand, cut away with sterile scissors and discard the outer edges of the sheet. Make a series of cuts about ¼ to 1 inch apart, parallel to the side of the sheet and opposite the edge held in the hand. Remove the cover of the tared Petri dish and place it on another sterile dish, the cover of which is removed at the time of cutting the sample. Cut squares of paper directly into the dish by making a series of cuts perpendicular to those made previously.

The particular type of disintegration equipment employed and the volume of liquid which it will handle satisfactorily will govern the amount of paper sample which is to be cut for disintegration. Therefore, cut sufficient paper to make a 1.0% suspension of fibrous material after disintegration has been completed. (Not less than 2.0 grams of paper sample should be used.) Replace the cover on the Petri dish; check the weight and adjust the excess or deficiency to obtain the desired weight of sample.

(b) Disintegration. Place the weighed sample and the necessary volume of sterile water in the disintegrator cup or jar. In adding material to the cup do not touch the metal cap with the hands, but lift it by grasping the paper hood which was placed over the cup before sterilizing. Lift both hood and metal cap only enough to permit access to the cup. If several paper samples are to be examined, cool the water blanks to prevent the temperature of the disintegrated sample from exceeding 45°C. (113°F.) during disintegration. Let the paper hood remain on the cup at all times to prevent possible contamination through the opening in the metal cap or around the top of the cup.

Place the cup containing the weighed paper sample and sterile water in the mixing machine and run for approximately 6 minutes, or until disintegration of the paper is completed. Test the sterility of the cups periodically by adding sterile water, as when examining paper, and then culturing portions of the rinse water for controls.

2. Control Testing of Disintegration Equipment and Technique

Make control tests on the technique of disintegration at frequent intervals by using a sample of sterilized paper and following the above procedure in detail. Plates containing such samples should be free from colonies of bacteria.

Plating and Incubating

In culturing a disintegrated paper sample, distribute with a sterile pipet a total of 10 ml. of the pulped mixture in approximately equal portions in five Petri dishes. Add to each plate 15 to 20 ml. of standard nutrient agar, cooled to about 45°C. (113°F.), then agitate the plates individually to disintegrate clumps of pulp and obtain an even distribution of the paper

fibers in the medium. A reciprocating motion, similar to that on the wire screen of a fourdrinier machine, is desirable. It is important that all lumps of pulp be broken up in order that the plates may be examined easily and accurately. Pour one control plate (without paper pulp) with each set of five plates, thus providing an agar control for each paper sample examined.

After the plates have been agitated, place them on a level surface until the medium solidifies; then invert and incubate the plated samples at 37 ± 0.5°C. (98 ± 1°F.) for 48 hours. Do not stack the plates too closely in the incubator.

Counting Plate Cultures

After incubation for 48 hours at 37°C., examine the cultures for the presence and number of colonies by holding the plates against a dark background, indirectly lighted. Plate counters are especially desirable.

The amount of fibrous material distributed over a given area of plate surface has been found to be an important factor in the number of colonies observed in a given sample of paper. Therefore it is important to follow carefully the directions regarding the pulp consistency (1.0%), volume of sample plated (10 ml.), and the number and size of plates used.

If the paper has been separated into individual fibers and mixed well in the medium, the colonies may be easily counted. If any particles are observed in the cultures which cannot be definitely identified as colonies, they should be examined microscopically. Plates with spreading colonies should be counted if at all possible; otherwise, they should be reported as "spreading colonies." Examine control plates also and make a record of the number of colonies found on the control of each paper sample.

Calculation of Results

Results for paper samples are expressed as the number of colonies per gram of air-dry paper examined. Since the consistency of the fibrous suspension made from such samples is 1.0%, there is present 1.0 gram of stock in each 100 grams of suspension. A total of 10 ml. of the pulped mixture (0.10 gram of actual paper) is cultured in five plates. Therefore, to obtain the number of colonies per gram of paper, multiply the total number of colonies found by 10.

Report

Report the average number of colonies per gram according to the following method (*2*):

Number of colonies per gram	Report to nearest
1 to 50	1
51 to 100	5
101 to 250	10
251 to 500	25
501 to 1,000	50
1,001 to 10,000	100
10,001 to 50,000	500
50,001 to 100,000	1,000
100,001 to 500,000	10,000
500,001 to 1,000,000	50,000
1,000,001 to 10,000,000	100,000

As indicated above, the count of any particular sample of paper is obtained by multiplying the total count on the plates by 10. However, when the counts of several samples are to be averaged, the logarithmic method of averaging is recommended. This method of averaging tends to minimize the effect of occasional high counts which may have resulted from some transitory condition in the plant. Details concerning logarithmic averages may be found in the U. S. Milk Ordnance and Code (*3*).

Example: Count	Log.
100	2.0
1,000	3.0
10,000	4.0
	9.0

Logarithmic average = 3.0
or 1000 colonies per gram.

Literature Cited

1. Am. Public Health Assoc., "Standard Methods for the Examination of Water and Sewage," 8th Ed., p. 201 (1936).
2. *Ibid.*, p. 209.
3. U. S. Public Health Service, "Milk Ordinance and Code," *Bull.* 220 (1939).

TAPPI Notes

Leslie L. Larson, formerly of the Edgewood Arsenal is now technical director for the Detroit Sulphite Pulp and Paper Company, 9125 Jefferson Street, Detroit 19, Mich.

R. D. (Bon) McCarron is now manager of the Cincinnati Branch of Stein, Hall & Co., Inc., Union Central Bldg., Cincinnati, Ohio.

O. P. Gephart of A. M. Meincke & Co. is now located at 200 Carroll Street, Syracuse, Ind.

Richard Collins, formerly manager of the Wayagamac Div., Consolidated Paper Corp., Ltd., is now manager of all divisions and is located at the main office in Montreal, P. Q.

K. A. Hultan, engineer, is now located at 3122 Euclid Ave., Berwyn, Ill.

Wiley L. Jennings has left the WPB Paper Division and is now papermill superintendent at the Covington, Va. mill of the West Virginia Pulp and Paper Company.

L. M. Worling, director and secretary of the Clyde Paper Company, Ltd., Rutherglen, Scotland has succeeded A. Alistair Rose (retired) as corporate representative in the Technical Association of the Pulp and Paper Industry.

John F. Carroll has retired as superintendent of the Franklin Paper Company, Holyoke, Mass.

John S. Wilson has retired as general manager of the Dryden Paper Co. Ltd., Dryden, Ont. and is now living in Uxbridge, Ont.

The Southwestern Engineering Company of the Philippine Islands has become reestablished in Manila, P. I. Since most of the supplies in the Islands were looted or destroyed by the Japanese there is a demand for all kinds of merchandise. Paper is one of the commodities in great need. Companies interested should communicate with P. J. Thibodeaux, Jr., Southwestern Engineering Company, 4800 Santa Fe Ave., Los Angeles 11, Calif.

Whiting-Plover Advances Leech

STEVENS POINT, Wis., July 16, 1945—Election of Thomas Leech as vice-president of the Whiting-Plover Paper Company, and his appointment as sales manager is announced by Frank B. Whiting, president. Mr. Leech became associated with the company in 1938. After a short period in the advertising and sales promotion department, he has been engaged primarily in general sales work.

At a special stockholders' meeting on July 9, two additional directors were elected. Mr. Leech was also named a director, as was A. J. Schierl, secretary and assistant general manager. Other officers and directors are Frank B. Whiting, president; J. H. Miller, vice-president and general manager; and George A. Whiting, treasurer.

Adsorption

The McGraw-Hill Book Company has recently published a book entitled "Adsorption" by C. L. Mantell, consulting chemical engineer (386 pp. 5½x8½). This is a book on practice rather than theory, and is written for the designer and operator of equipment, emphasizing unit operations. Among the subjects covered are fullers earth and activated clays, bone-char and related materials, decolorizing and water-treatment carbons, silica-gel, odor removal, gas masks, dehydration of air and gases, including air-conditioning, ion-exchangers, and inspection, specifications, and testing of adsorbents.

Adsorbents are specific in their nature and properties. From the application viewpoint, adsorption processes are often divided into:

1. Separation of gases from gases, as deodorization of air and elimination of toxic gases.
2. Separation of vapors from gases, as in the recovery of solvents, drying of gases and dehumidification.
3. Separation of solutes from solutions, as decolorizing and clarifying of liquids.
4. Separation of ions from solutions, as in the concentration of metals on adsorbents.
5. Separation of dissolved gases or suspended solids from liquids as in water treatment.
6. Concentration of dissolved materials, often toxic in nature, to eliminate them from liquids, as in the case of medicinal carbons, which take up poisonous compounds.
7. Fractionation by selective adsorption of gases from gases, vapors from gases, vapors from vapors, liquids from liquids, dissolved materials from other solutes and then concentration of these.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $4.50 per copy.

CINCINNATI
RUBBER COVERED
PRESS ROLLS

Made today of synthetic rubber, they do a good job. Into every cover goes the same experience and precision workmanship that built a reputation for Cincinnati Rubber Covered Rolls. You get maximum results from materials available. Specify Cincinnati and be sure.

THE CINCINNATI RUBBER MFG. CO., CINCINNATI, O.

Brazil Sees Paper History

"A Pictorial History of Paper" published last year by the Bulkley, Dunton Pulp Company, has been translated into Portuguese, and the entire book, complete with its 22 illustrations, reprinted by the Brazilian illustrated magazine, *Vida Domestica* of Rio de Janeiro. A long editorial in which the Brazilian magazine pays tribute not only to the book but to the pulp paper and graphic arts industries of the United States says in part—"beautiful text paper was used in the printing of the book, which testifies to the high degree of progress of the (U.S.) industry. The printing and artistic arrangement are extraordinarily beautiful."

Illustrations and excerpts of "A Pictorial History of Paper" have been previously reprinted by several United States publications, and the Art Directors Club selected the book to be included in its annual exhibition of representative advertising art. First exhibited at the 1945 Art Directors show in Rockefeller Center, "A Pictorial History of Paper" is now part of a traveling exhibit on a cross-country tour.

Studies Cooling Problems

An interesting study of the correction of cooling system problems is outlined in a pamphlet just issued by D. W. Haering & Company, Inc. of Chicago. It describes the correction of an accelerated corrosion problem on the water side of process equipment used in the manufacture of synthetic dye-stuffs. Plant operations contributed to a wide fluctuation in the chemical constituents of the recirculating cooling water. Even under trying conditions, Haering Glucosates maintain clean, corrosion-free heat transfer surfaces.

The New Plastics

The New Plastics by Herbert R. Simonds, consulting engineer, M. H. Bigelow, formerly of the Plaskon Company, and Joseph V. Sherman, economist, has recently been published by D. Van Nostrand Company (320 pp. 6x9). It covers the important advances made during the past five years by the plastics industries. Information is given relative to composition, methods of manufacture and fabrication, properties and uses of all of the new plastics—those that have already reached tonnage production, as well as the newest ones that are closer to the pioneer stage. New processes and new applications have appeared in profusion since 1940 and the production of so-called borderline materials, such as synthetic rubbers, organic coatings, and adhesives, has exceeded anything known in the past. This book is supplemental to earlier books on plastics.

Among the chapters of particular interest to the paper industry are the following: Review of the Industry up to 1940, Most Recent Developments, Established New Materials, Improvement in Materials, New Fibers, New Adhesives, New Laminating Materials, New Applications of Wood and Paper, New Forms and Coatings, Plastic Trends.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 E. 42nd Street, New York 17, N. Y., at $4.50 per copy.

Register Tests on Contours

A new type moisture register is now available for testing a wide variety of materials having curved, rough or flat surfaces. This new Model K-2, recently developed by the Moisture Register Company, Alhambra, Cal., incorporates a new type electrode equipped with buttons individually spring-cushioned to allow every button to maintain contact regardless of the contour of the material tested. It is in addition to the model long established for testing lumber and other flat surfaces.

The Model K-2 is especially adapted for testing the following materials: paper in stacks or rolls of varying diameters; bolts; rolls, or stacks of cloth; rough lumber; plaster and other materials having curved or irregular surfaces. The K-2, like all other Moisture Registers, operates on the principle of power absorption from a high-frequency oscillator circuit. An important feature of the instrument is its ability to determine low moisture percentages, actually providing readings down to zero percent.

Accurate moisture checks with Model K-2 can be made by anyone in three seconds or less. The instrument is portable, weighs only five pounds, and is supplied with a convenient carrying case.

Sherman Features Liners

NEWTON UPPER FALLS, Mass., July 16, 1945—Sherman Paper Products has issued a timely catalog illustrating baking and packaging products in full color and discussing the ways in which Sherman pan-liners save sugar. One section of the catalog, cleverly illustrated with cartoon sketches, discusses the wartime contributions of pan-liners in saving time, pans and fat. Other helpful sections show tables of standard sizes for both pans and pan-liners and methods of measuring different types of pans.

Copies of the catalog may be obtained from the Sherman home office in Newton Upper Falls, Mass.

Powell Appoints Stiles

The William Powell Company, valve specialists and manufacturers of Cincinnati, Ohio, has appointed Allen B. Stiles as manager of the Philadelphia and Baltimore territory. Mr. Stiles, whose office is at 1520 Locust Street, Philadelphia 2, Pennsylvania, is well known throughout the eastern section of the country, having represented the Crane Company for the past several years.

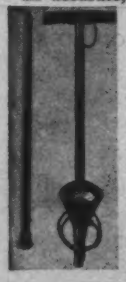
Tells of Crystallizers

Just off the press is a new catalog bulletin issued by Swenson Evaporator Company, Division of Whiting Corporation, Harvey, Illinois, covering their line of vacuum crystallizers. Installation photographs and drawings are used throughout to illustrate this eight-page bulletin and the important features, applications and advantages of these crystallizers are clearly shown. Sizes and capacities, construction and operation are all explained in this attractive two-color publication.

Copson Directs Research

Appointment of Dr. Raymond L. Copson, formerly chief of chemical research and engineering for the Tennessee Valley Authority at Muscle Shoals, to be director of research for Rumford Chemical Works is announced by Rumford's President, Albert E. Marshall.

• In order to provide quality paper, it is necessary to maintain the surface temperature of every roll in the drying-roll train "right on the target." The Cambridge Surface Pyrometer is an accurate, rugged instrument which indicates roll surface temperatures quickly. Its routine use will go a long way in preventing spots, cockle, curl and blisters. The *Cambridge* is so convenient to use that workmen *willingly* use it—*regularly*.



Write for bulletin 194-S

The *Cambridge* is made in hand model and with an extension attachment to reach those hard-to-get-at places.

CAMBRIDGE INSTRUMENT CO., Inc.
3702 Grand Central Terminal, New York 17, N. Y.

CAMBRIDGE
SURFACE PYROMETERS

PAPER MILL OPERATORS!

Are you interested in—

CONTROLLED PARTICLE SIZE AND SETTLING RATES FOR LIME, BY METHOD OF REBURNING AND SLAKING?

Write us making appointment to have a talk with our engineer.

TRAYLOR ENGINEERING & MANUFACTURING CO.

ALLENTOWN, PENNA., U. S. A.

Inspect the MACHINE WORK *of any Kennedy Valve*

THE large Kennedy line includes bronze and iron body gate, globe, angle and check valves for low, standard, medium and extra heavy pressures. Each type has several "extra value" features that make Kennedys the best possible valve investment. Specify Kennedys on your next valve order and you will quickly see the advantages of standardizing on them. Obtainable at your local dealer.

NOTICE the smooth, true surfaces, accurate threading, clean finish, and perfect fit of all parts. Kennedy machinists are long-experienced, and the strictly modern automatic machine tools with which they are provided enable them to turn out flawless work.

The result—Kennedy Valves look trim and clean-cut; and, more important, they operate easily, close tightly, are readily taken apart and reassembled, and all parts are interchangeable.

The Kennedy Valve Mfg. Co., Elmira, N. Y.

KENNEDY

VALVES-PIPE FITTINGS-FIRE HYDRANTS

New York Paper and Pulp Market Review

Paper Supply Situation Reflects Expected Substantial Improvement In Current Third Quarter—Swedish Ships Dock With 8,400 Tons of Wood Pulp — Paper Stock Supply Is Now Deteriorating.

Office of the PAPER TRADE JOURNAL,
Wednesday, July 18, 1945.

A more adequate supply of paper is indicated in the favorable reports of the War Production Board, and from amendments to existing governmental orders. The third quarter allocation program marked a step to more freedom for the paper industry, a government report stated. Although current supply in all major types of paper is widely reported as tight, reports received this week from most of many manufacturers' representatives, jobbers, and general paper merchants, are optimistic of the future.

Production of paper aggregated 1,424,285 tons in May, 1945, compared with 1,424,285 tons in April, and with 1,484,667 tons in May, 1944. The arrival on July 15 of 8,400 tons of Swedish wood pulp at New York and Boston ports, adds another encouraging note to the improving trend back to a more normal state of business activity.

Paper production for the week ended July 7, a holiday week, was estimated at 52.7%, compared with 50.9% for 1944, with 66.2% for 1943, with 69.7% for 1942, and with 95.2% for the corresponding week in 1941.

Paperboard production for the week ended July 7 was 62.0%, compared with 60.0% for 1944, with 69.0% for 1943, with 52.0% for 1942, and with 77.0% for the corresponding week in 1941.

Pulpwood

Mill receipts of pulpwood in May totaled 1,461,000 cords, compared with average receipts of 1,240,000 cords in the years 1941-1944. Receipts for the first five months of 1945, of 6,793,000 cords, compared with 6,918,000 cords in 1944, or a decline in 1945 of 1.8%.

Wood Pulp

Wood pulp production by U. S. mills in May aggregated 919,000 tons, compared with 865,000 tons in 1944, and with 832,000 tons in May, 1943. Output for the first five months of 1945 totaled 4,330,000 tons, compared with 4,119,000 tons in 1944, an increase of 5.1%; consumption increased 3.1%; imports decreased 6.4%; exports decreased 9.5%, and inventories declined 8.1% in the first five months of 1945, compared with 1944.

Rags

Demand for cotton cuttings is reported active at this date. The new OPA No. 4 Amendment to MPR-344, on mixed cotton, linen or underwear cuttings went into effect on July 14. It establishes ceiling prices on mixed cuttings purchased by non-consumers, not in the rag assorting business. It is intended to protect established packers and dealers in rags.

Prices on cuttings are strong at ceiling levels.

Trading in old cotton rags continues active. Prices in all grades are firm.

Old Rope and Bagging

No change of importance has been reported in the old rope market this week. Manila fiber is on the latest list of critical materials and supply is well below mill requirements.

Buying in old bagging is reported largely in No. 1 gunny. No change from a relatively slow rate of activity in scrap bagging has been reported at this date. Prices are firm.

Old Waste Paper

Supply of paper stock continues to reflect a gradual tighter situation, as had been expected during July and may continue into August, which are seasonally dull. The charted trend of mill receipts continued upward until May; for which month receipts totaled 724,000 tons, compared with 711,000 tons in May, 1944, and with 583,000 tons in May, 1943. Receipts for the first five months of 1945 aggregated 3,365,000 tons, compared with 3,484,000 tons in 1944, or a decrease of 3.4%; total consumption was 3,501,000 tons, a decrease of 0.03%, and inventories totaled 695,000 tons, a decrease of 2.3% from the five-month period in 1944.

Twine

No change of importance has been reported in the twine market this week. All the stronger fibers appear in the latest critical materials list of the WPB.

Prices continue firm and unchanged.

OPA Lists Book Paper Ceiling Prices

WASHINGTON, D. C., July 18, 1945—Manufacturers' existing "frozen" ceiling prices for sales of book papers to wholesale merchants and the Federal Government have been listed in dollar-and-cent terms in a revision of the book paper regulation, the Office of Price Administration announced today. The revision, effective July 19, 1945, embodies, without change, the former pricing provisions for sales by manufacturers to other than wholesale merchants and the Federal Government. Existing differentials are also continued.

Since January 5, 1945, manufacturers' ceilings for all book papers sold to wholesale merchants and the Federal Government were frozen at the highest lawful prices each manufacturer had in effect during the final quarter of 1944.

The new listing will make it clear to both sellers and buyers just what the ceiling prices are for each brand of paper sold. The brands of each producing company are grouped together, for convenience.

Bristol Offers New Time Recorder

A new instrument for recording machine running-time has been developed by The Bristol Company, Waterbury 91, Connecticut, for checking machine performance. The instrument records the operating or "on" time of production machinery and other similar equipment. The chart record gives the total "on" time in hours, minutes, and seconds for a given period. "Off" periods are also shown on the chart as well as the time at which they occurred.

The running-time readings are magnified in such a way that the total operating time of a machine can be easily and accurately determined to within a few seconds.

For FIBER BOARD

MAPICO Reds

Several standard shades permit a variety of rich deep reds and pleasing tints ranging through orchid, coral and pink.

Good fiber adhesion, permanent color (light, acid and alkali resistant), high tinting strength and uniformity have made these fine precipitated iron oxides much sought after by paper manufacturers.

Mapico production is now at an all-time peak. If you have difficulty in filling your requirements large demands for war uses are the cause.

Look to MAPICO for Leadersh

MAPICO Colors

PURE OXIDES OF IRON

YELLOWS · REDS · BROWNS · BLACK

COLUMBIAN COLLOIDS

We will gladly send samples and complete technical data.

COLUMBIAN CARBON COMPANY
MAGNETIC PIGMENT DIVISION
MANUFACTURER

BINNEY & SMITH CO., *Distributor*
41 EAST 42nd STREET · NEW YORK 17, N. Y.

This stuffing box won't need repacking for a long, long, time . . .

PALMETTO Packings stop leaks and do not wear out the rod or shaft.

Complete internal lubrication reduces friction, saves wear of both packing and equipment and keeps the packing soft and resilient for extremely long periods of time.

The result is long, economical service, saving time, material and trouble.

There is a PALMETTO Packing available for every condition of service.

Write for descriptive literature.

GREENE, TWEED & COMPANY
Bronx Blvd. at 238th St., New York 66, N. Y.
Plants at New York, N. Y. and North Wales, Pa.

For Final Victory—
Buy MORE War Bonds

PALMETTO

PALMETTO for steam, water, air • PELRO for oils • CUTNO for alkalis • SUPER CUTNO (dyed asbestos) for gas • XTERO for foods

Self-Lubricating PACKINGS

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, July 18, 1945.

BLANC FIXE—Quotations on blanc fixe continue unchanged. Demand is reported fair. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—Current demand active. Supply situation reported good. March output up at 2,950,000 pounds. Quotations continue unchanged. Prices on bleaching powder range from $2.50 to $3.10 per 100 pounds, in drums, car lots, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point.

CAUSTIC SODA—Demand continues very heavy. Production high but below current needs. Supply tight in dry grades. Solid caustic soda is quoted at $2.30 per 100 pounds; flaked and ground is quoted at $2.70 per 100 pounds; all in drums, car lots, at works.

CHINA CLAY — Quotations on china clay are unchanged. Current demand is reported fair. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Demand heavy with essential requirements met. Brightness of paper attained by chlorine revoked. Quotations unchanged. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—Offerings and sales light. "G" gum rosin at $5.79 per 100 pounds, in barrels, at Savannah; "FF" rosin at $5.75 per 100 pounds in barrels, at New York; seventy per cent gum rosin size at $5.95 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake are reported unchanged for the current week. Consumption is reported moderate at this date. Domestic salt cake is quoted at $15 per ton, in bulk. Chrome salt cake is quoted at $16 per ton. All prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand continues for all-over requirements. Bulk lot shipments fairly prompt. Bagged lots still slow. Quotations continue unchanged. Current prices, car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Current corn receipts are light this week and demand is active. Prices firm at this date. Starch prices continue unchanged. The pearl grade is quoted at $3.72 per 100 pounds; powdered starch at $3.83 per 100 pounds; all prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA — Demand reported good. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.25 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is currently quoted at $1.85 per 100 pounds, in bags, at works.

SULPHUR—Quotations on sulphur continue to conform to prevailing market prices. Demand active. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price at Gulf Ports is $17.50 per long ton.

TALC—Prices on talc continue unchanged. Demand good. Domestic grades are currently quoted at from $16 to $21 per ton at mines; Canadian at $24 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$61.00	@	—
Sheets	69.00	@	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. t. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*50.00	@	—
Chip	*50.00	"	—
Sgl. Mis. L.l. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.80
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65@	$15.30
No. 2 Glossy Coated	12.40 "	14.00
No. 3 Glossy Coated	11.60 "	12.35
No. 4 Glossy Coated	11.15 "	12.75
No. 1 Antique (watermarked)	10.25 "	11.75
No. 2 Offset	9.60 "	11.00
A Grade E. F.	9.35 "	10.75
A Grade S. & S. C.	9.60 "	11.00
B Grade E. F.	8.85 "	10.20
B Grade S. C.	9.10 "	10.50
C Grade E. F.	8.55 "	9.75
C Grade S. C.	8.80 "	10.00
D Grade E. F.	8.25 "	9.50
D Grade S. & S. C.	8.50 "	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.10
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich ..72.00 @	82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	73.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	13.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

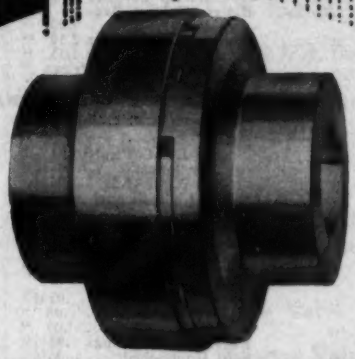
New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	2.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	2.50*

*OPA Maximum Prices

Here's Some Exceptionally Interesting NEW READING!



NEW! L-R Type "C" Pat. & Pats. Pend. Shrouded by extension of outside steel collar for protection, and minimum resistance even to airflow. 2 to 2500 h.p.

For the Pulp and Paper Mill Industries

L-R FLEXIBLE COUPLINGS

New revised L-R Catalog illustrates and describes Couplings particularly fitted to the special requirements of equipment for pulp and paper manufacture.

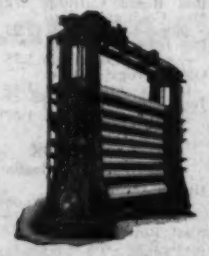
L-R COUPLINGS FOR EVERY DUTY

For correction of misalignment—take-up of shock and vibration—insurance of full smooth power flow. *Extremely quiet.* Resilient load cushion always in sight for inspection. NO SHUT-DOWNS FOR CHANGING. Couplings for every kind of service, 1/6 to 2500 h.p. SELECTOR CHARTS come with Catalog, leading you right to couplings you want, without tedious figuring. Wire or write.

LOVEJOY FLEXIBLE COUPLING CO.

5069 West Lake St. Chicago 44, Ill.

These 4 LOBDELL . . . Quality Products . . . will put *punch* into your postwar production



1 AUTOMATIC ROLL GRINDER . . . Takes the "guess work" out of roll grinding; grinds and feeds automatically. Grinds rolls accurately in your own plant without tying up calender stacks unnecessarily.

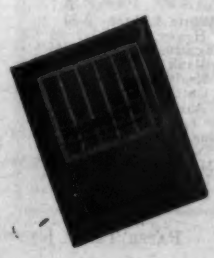
2 CALENDER STACKS . . . Accurate, durable and easy to operate. Maintenance costs are low. Chosen unanimously by over 300 modern paper mills.

3 "PURALOY" CALENDER ROLLS . . . For excessively severe service such as water finish or high pressure stacks. These rolls are 10 to 15 percent harder than ordinary chilled iron rolls and tests have shown them to be more resistant to corrosion and abrasion. Made in different alloys for use with dyes and chemicals in paper, rubber, paint, oil and other industries.

4 MICROMETER ROLL CALIPERS . . . For keeping check on roll accuracy before and after regrinding. Light weight, extremely accurate, easily adjusted for varying roll diameters.

Here is a line of machinery for the paper making and allied industries that you should by all means consider when making plans for post war replacements. Your share of the back log of orders may tax the resources of your present equipment. Check up on your needs now . . . our engineering consultation is available.

Fill in the coupon; clip to your letter head and mail now . . . while you think of it. Catalog with complete information will be sent by return mail.



Name .....

Position .....

Send Data on Items Checked:

Grinders Stacks Rolls

Roll Calipers PTJ, 7-19

SIGN and MAIL... today

LOBDELL

COMPANY ESTAB. 1836 WILMINGTON 99, DEL.

Built and sustained upon the rights to FREE, COMPETITIVE PRIVATE ENTERPRISE guaranteed by the Constitution of the United States

New Improved Roll Grinding Machines • Rolls • Calender Stacks • Roll Calipers

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Thirds and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.30	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

Pre-War Quotations

All Prices Nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	@	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Prices.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¾
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04½
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings (Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean bright—Sisal Strings	.04	"	—
No. 2 Clean bright—Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.13	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South American	—	"	3.25
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¾	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06¾
Underwear Cutters, Bleached	.06¾	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¾
New Black Silesias	.03	"	.03¾
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¾	"	.03½
New Canvas	.06¾	"	.06½
B. V. D. Cuttings	.06¾	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.35	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
Old Manila Rope	5.75	"	—*

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—

FIBRE MAKING PROCESSES INC.

435 North Michigan Ave. Chicago 11, Ill.
Russ Building San Francisco 4, Cal.
Fibre Making Processes (Canada) Ltd.
c/o Horton Steel Works Ltd.
Fort Erie, Ont.

- U-Bar Barking & Washing Drum
- Orrmell Log Barker
- Waplan Bark Press
- Nekoosa Chip Cutter
- F. M. P. Circ. & Ind. Heating System
- Blow Steam Plants
- Coolidge Chip Packer
- F. M. P. Coarse Screen & Knotter
- Thune Pressure Filter
- Norman Chip Duster
- Drammen Blow Valve
- Sandberg Diffuser Valve

West Virginia Pulp and Paper Company

230 Park Ave. New York
35 East Wacker Drive Chicago
Public Ledger Building Philadelphia, Pa.
503 Market St. San Francisco, Cal.

Manufacturers of

ENGLISH FINISH SUPERCALENDERED
MACHINE FINISHED BOOK
and LITHOGRAPHIC PAPERS

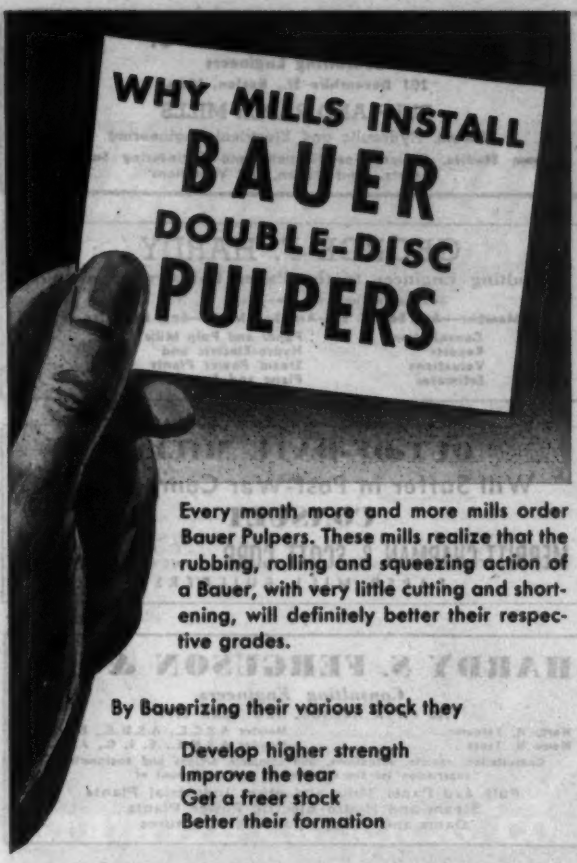
Offset, Envelope, Bond, Writing, Mimeograph, Ledger
Eggshell, Cover and Music Papers, Index Bristol,
Post Card and Label Papers

HIGH GRADE COATED BOOK

. . .

KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:
Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina



Every month more and more mills order Bauer Pulpers. These mills realize that the rubbing, rolling and squeezing action of a Bauer, with very little cutting and shortening, will definitely better their respective grades.

By Bauerizing their various stock they

Develop higher strength
Improve the tear
Get a freer stock
Better their formation

Bauers are outstandingly effective on kraft and sulphite knotter and screen rejects, semi-chemical and semi-sulphite pulps, ground wood screenings.

Use Bauers on mixed papers to help combat current stock shortage.

Two sizes—36" and 24". Variety of plate patterns.

Write for full particulars.
Get your Bauer on order.

THE BAUER BROS. CO.
SPRINGFIELD, OHIO

CHAS. T. MAIN, INC.
Consulting Engineers
201 Devonshire St., Boston, Mass.
PULP AND PAPER MILLS
Steam, Hydraulic and Electrical Engineering
Process Studies, Design, Specifications and Engineering Supervision
Reports, Consultation, and Valuations

GEORGE F. HARDY
Consulting Engineer to the Paper Industry since 1900
441 Lexington Ave., New York 17, N. Y.
Member—Am. Soc. C. E.—Am. Soc. M. E.—Eng. Inst. Can.
Consultation, Reports, Valuations, Estimates
Paper and Pulp Mills, Hydro-Electric and Steam Power Plants, Plans and Specifications

OUT-OF-DATE MILLS
Will Suffer in Post-War Competition
CONSULT
MERRITT-CHAPMAN & SCOTT CORP. 17 BATTERY PLACE NEW YORK 4, N. Y.
PAPER MILL BUILDERS

HARDY S. FERGUSON & CO.
Consulting Engineers
299 FIFTH AVENUE, NEW YORK CITY
Hardy S. Ferguson.....Member A.S.C.E., A.S.M.E., E. I. C.
Hiram N. Todd.....Member A.S.M.E., E. I. C., A.S.C.E.
Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of
Pulp and Paper Mills and other Industrial Plants
Steam and Hydro-Electric Power Plants
Dams and Other Hydraulic Structures

THE RUST ENGINEERING COMPANY
Engineers and Constructors
Pittsburgh, Pennsylvania
Complete Service
for
PULP AND PAPER MILL PLANTS AND FACILITIES
DESIGN, CONSTRUCTION, MODERNIZATION

JOHN G. SHELLEY
WELLESLEY, MASS.
Bias Laid Rubber Paper Machine Aprons—Side Aprons—Water Box Covers—Color Box Covers—Cotton Deckle Webbing

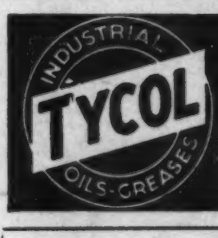
JOHNSON & WIERK, INC.
PULP AND PAPER MILL ENGINEERS
415 Lexington Ave. NEW YORK, N. Y.

FREDERIC C. CLARK
CONSULTING ENGINEER
BROAD EXPERIENCE IN MANUFACTURE OF PULP AND PAPER
SPECIALIST IN PLANT DESIGN
SURVEYS OF MILLS AND PROCESSES
CONSULTATION ON TECHNICAL PROBLEMS
7 DEY STREET NEW YORK, N. Y.

KOHLER AUTOMATIC WEB TENSION CONTROLS maintain an absolutely constant, uniform unwinding or rewinding tension from start to finish of each roll.
THE KOHLER SYSTEM COMPANY
159 E. CHICAGO AVENUE CHICAGO 11, ILL.

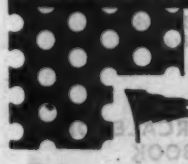
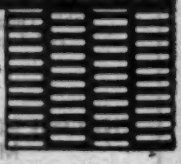
STEAM TURBINES — CENTRIFUGAL PUMPS
HELICAL GEARS — PROPELLER PUMPS
WORM GEARS — GLOBLESS PUMPS
CENTRIFUGAL BLOWERS AND COMPRESSORS — MIXED-FLOW PUMPS
DE LAVAL MOTOR PUMPS
DE LAVAL STEAM TURBINE CO. TRENTON 2, NEW JERSEY

PULP MILL MACH'Y FINISHING ROOM MACH'Y
FRICTION CLUTCHES



A COMPLETE LINE
OF TYCOL LUBRICANTS SCIENTIFICALLY ENGINEERED FOR EVERY INDUSTRIAL USE
Tide Water Associated Oil Co.
Eastern Division
17 Battery Place, New York, N.Y.

DEINKING — DECOLORIZING
K-121-B and K-C-2
COOKING PROCESSES
THE KINSLEY CHEMICAL COMPANY
12500 Berea Road Cleveland, Ohio

PERFORATED METAL SCREENS

MADE SPECIALLY FOR PAPER and PULP MILL USE
Copper, Bronze, Steel, Stainless Steel and other metals, Heat-treated.

HENDRICK MFG. CO
50 Dundaff St., Carbondale, Pa.
Offices in Principal Cities

Jordan Shell and Plug Fillings
TRADE-MARK
POSITIVE
Reg. U. S. Pat. Off.
High Speed Disc Refiner
THE BAHR BROTHERS MFG. CO.
MARION, INDIANA, U.S.A.

Appleton Wires are Good wires
APPLETON WIRE WORKS INC. APPLETON, WIS.

Price & Pierce Ltd.

WOOD PULP & PAPER AGENTS

for domestic and export

60 East 42nd Street, New York 17, N.Y.

Chemicals FOR PULP & PAPER

LIQUID CHLORINE
CAUSTIC SODA

OTHER STAUFFER PRODUCTS

*Aluminum Sulphate
Borax
Boric Acid
Carbon Bisulphide
Carbon Tetrachloride
Citric Acid
*Copperas
Cream of Tartar
Muriatic Acid
Nitric Acid
Silicon Tetrachloride
Sodium Hydrosulphide
Stripper, Textile
Sulphur
Sulphuric Acid
Sulphur Chloride
*Superphosphate
Tartar Emetic
Tartaric Acid
Titanium Tetrachloride

(*Items marked with star are sold on West Coast only.)

STAUFFER CHEMICAL CO.
NIAGARA DIVISION

420 Lexington Avenue, New York 17, N. Y.
221 North LaSalle Street, Chicago 1, Illinois
424 Ohio Bldg., Akron 8, O.
555 South Flower St., Los Angeles 13, Cal.
636 California Street, San Francisco 8, Cal.
Orlando, Fla.
North Portland, Oregon
Houston 2, Texas

Kalamazoo GLAZED TILE

— The Finest Material for Paper Mill Needs —

Hundreds of paper mill executives and engineers know that Kalamazoo Tile construction costs less—lasts longer—controls stock better—requires less maintenance—and is more flexible as to size or design in meeting production layouts.

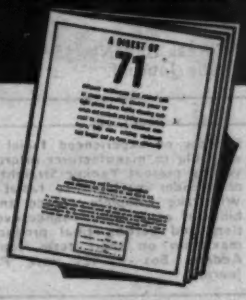
No other material equals the smooth, hard surface that is impervious to most chemicals—flushes clean—does not flake, pit or scale—and is free from friction.

Should fins—midfeathers—agitators—round—square or tapered ends, corners and bottoms be needed—the exclusive Kalamazoo method makes it easy to construct and moderate in cost, usually less than reinforced concrete.

Ask for engineering data.

Kalamazoo TANK & SILO CO.
KALAMAZOO — MICHIGAN

71 Ways to Expedite Power Plant Maintenance



DESCRIBED IN NEW, FREE OAKITE DIGEST

Prepared particularly for busy paper mill engineers who supervise power plant operation, this new Oakite Digest gives easy-to-follow instructions for speeding up and simplifying many maintenance and related power plant cleaning jobs. The plant-tested techniques can help you conserve time and effort when undertaking maintenance modernization work . . . when installing improvements postponed by wartime pressure.

This practical guide describes such essential work as maintenance cleaning of air conditioning, steam generating and electric power equipment; it also outlines time-saving methods of descaling, desliming, derusting and paint stripping. A FREE copy is ready for you—so write us TODAY!

OAKITE PRODUCTS, INC. 48A Thames St., NEW YORK 6, N. Y.
Technical Service Representatives in All Principal Cities of the United States & Canada

OAKITE Busy Hands for Victory CLEANING

HELP WANTED

"A company of substantial position in the industry wishes to know of several young men, chemists and chemical engineers, of high order of technical education and of some proved ability in research and development, who are interested in making professional careers for themselves limited only by their own abilities.

"Unexpired terms in the armed services are no deterent to a post-discharge arrangement.

Address Box 45-335 care Paper Trade Journal. JL-19

CHEMICAL ENGINEER

For position as Assistant Chief Chemist in large southern kraft pulp and paper mill. Position is permanent with excellent opportunities for advancement. Applicant should have five to ten years experience in the kraft industry. Letter of inquiry should contain all pertinent information, regarding education, experience, service status, etc. Rules and regulations of the War Manpower Commission will be observed. Address Box 45-417, care Paper Trade Journal. A-9

WANTED

TOUR BOSS, MACHINE TENDER, SHIPPING CLERK. Board Mill located in Northeastern Pennsylvania, making Folding Grades.

Extensive plans for expansion under way.

Excellent post-war future assured. Permanent jobs, good chances for advancement for the right men.

Only men looking for permanent connection and steady work need apply. Box 45-411 care Paper Trade Journal. A-23

WANTED

Superintendent for single machine strawboard mill, making .009 corrugating.

Address Box No. 45-420 care Paper Trade Journal. J-19

Services of experienced facial tissue man available to manufacturer interestd in converting present Yankee Straight Fourdrinier or cylinder machines to facial production. Will take complete charge and responsibility of engineering change-over construction, and getting final production up to maximum on short term contract basis. Address Box 45-422 care Paper Trade Journal. A-2

WANTED

A New Jersey Manufacturer of Machinery for the paper and textile trade desires experienced machine designers and draftsmen for post-war work. Please furnish detailed information regarding education, experience, age, marital status, and recent photograph. Address Box No. 45-407 care Paper Trade Journal. J-19

MACHINE TENDER for cylinder machine operations. Must be experienced at this particular kind of machine operations. Prefer high school graduate or equivalent. Address Box 45-203 care Paper Trade Journal. TF

HELP WANTED for New England Book and Specialty Mill—Fourdrinier Machines:—6 Backtenders, 6 Thirdhands. Address Box 45-352 care Paper Trade Journal. JJ-10

HELP WANTED

CHARLES P. RAYMOND SERVICE INC.
294 Washington St., Boston, Mass.

Specializing in Paper Mill Personnel
Positions Now Open

General Superintendent bag manufacturing and printing
Salesman for groundwood specialties for Middle West territories
Mechanical Engineers (Several)
Mill Engineer (College Graduate)
Electrical Engineer, $5000-$5500
Accountants (Several)
Office Managers for Northern and Southern mills $3500-$4000 year
Chemists and laboratory men
Draftsmen and Designers (Several)
Tour Boss
Beater Engineers, Machine Tenders, Back Tenders, 3rd & 4th hands, Machinists, Millwrights
And many others

We invite correspondence (strictly confidential) with employers seeking personnel and men seeking new positions. J-19

WANTED—A Chemist and a physicist for research in development of new paper products and chemically treated papers. Research experience desirable but not necessary. Salary will be commensurate with experience and capabilities. Address Box 45-421 care Paper Trade Journal. J-19

CLASSIFIED ADVERTISING

HELP WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

SITUATIONS WANTED—5c a word, double rate for heavy face type. Minimum charge $1.25. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—5c a word. Double rate for heavy face type. Minimum charge $1.25.

WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

OPPORTUNITIES—5c a word. Double rate for heavy face type. Minimum charge $1.25.

Classified advertising space may also be purchased at $3.00 per single column inch.

All classified advertisements are payable in advance.

If box number is used—35 cents additional.

Address Replies

to advertisements appearing under Box Numbers in care of
PAPER TRADE JOURNAL
15 West 47th Street
New York 19, N. Y.

HELP WANTED

SALARIED POSITIONS — This advertising service of 35 years' recognized standing negotiates for high salaried supervisory, technical and executive positions. Procedure will be individualized to your personal requirements and will not conflict with Manpower Commission. Retaining fee protected by refund provision. Identity covered and present position protected. Send for details. R. W. BIXBY, INC., 117 Delward Bldg., Buffalo 4, N. Y. tf

SALESMAN for large folding carton and specialty manufacturer. Unusual opportunities. Give full qualifications, age and draft status. Replies held in strictest confidence. EMPIRE BOX CORPORATION, GARFIELD, N. J. A-2

WANTED—Machine Tender, Master Mechanic, Beater Engineer. Middle aged men preferred. Small .009 straw mill, slow running machines. Keuka Paper Corp., Penn Yan, N. Y. A-2

WANTED—Experienced Adjuster and Machine Tender for Lockport and National Paper Bag Machines, for flat and square bags. Plant in western New York. Address Box 45-385 care Paper Trade Journal. J-19

ENGINEER with 6 to 10 years experience in the paper industry for sales, design, erection and operating work in connection with concern building pulp and paper mills abroad. Will probably involve project residence various places abroad portion of time, balance in New York City. Expenses while abroad. First letter must state age, experience, education, draft status, salary expected. Send photo, if available. Give references in paper industry especially equipment firms. Address Box 45-395 care Paper Trade Journal. A-2

WANTED—We need a graduate chemist in our expanding product development laboratory who has a background of paper chemistry and is familiar with all types and kinds of paper coatings including resins and lacquers. Address Box 45-398 care Paper Trade Journal. A-16

SUPERINTENDENT for finishing department in large modern midwestern paper converting plant. Must be expert in laminating and coating of paper, plating, stack and friction calendering, and have a good chemistry background in paper and related materials. Knowledge of water-proofing of paper and application of lacquer and plastic coatings necessary. Address Box 45-210 care Paper Trade Journal. TF

WANTED—CHIEF CHEMIST for pulp and paper mill located on Pacific Coast. Apply in own handwriting giving references, experience and other pertinent information. Address Box 45-243 care Paper Trade Journal. TF

WANTED—A recent college graduate in paper chemistry to work in our laboratory on paper coating compounds and heat sealing compounds. Address Box 45-397 care Paper Trade Journal. A-16

RESIN RESEARCH. Development of resin applications to pulp, paper and related products. Preferably persons experienced with thermoplastic resins. College graduate, chemistry or chemical engineering. Permanent. Apply: The Institute of Paper Chemistry, Appleton, Wisconsin. J-19

SITUATIONS WANTED

SUPERINTENDENT—20 years experience in paper bag conversion of grocery, sacks and aniline or oil ink specialty bags. Capable of handling all bag shop problems. Thorough experience in supervision of help, maintenance and repairing of machines. Address Box 45-355 care Paper Trade Journal. A-2

YOUNG COLLEGE GRADUATE — Experienced in supervision, quality and technical control, also coatings, resins, plastics and board manufacturing—seeks opportunity in paper and allied fields. Address Box 45-381 care Paper Trade Journal. TF

TOUR BOSS—25 years experience on cylinder machines on all grades of paper. Age 38. Steady. Address Box 45-382 care Paper Trade Journal. J-19

COATING AND FINISHING SUPERINTENDENT—Thorough experience in coating and finishing of all types cardboards. Now employed, wishes change. Address Box 45-384 care Paper Trade Journal. J-26

miami DV
handles 6% stock with ease

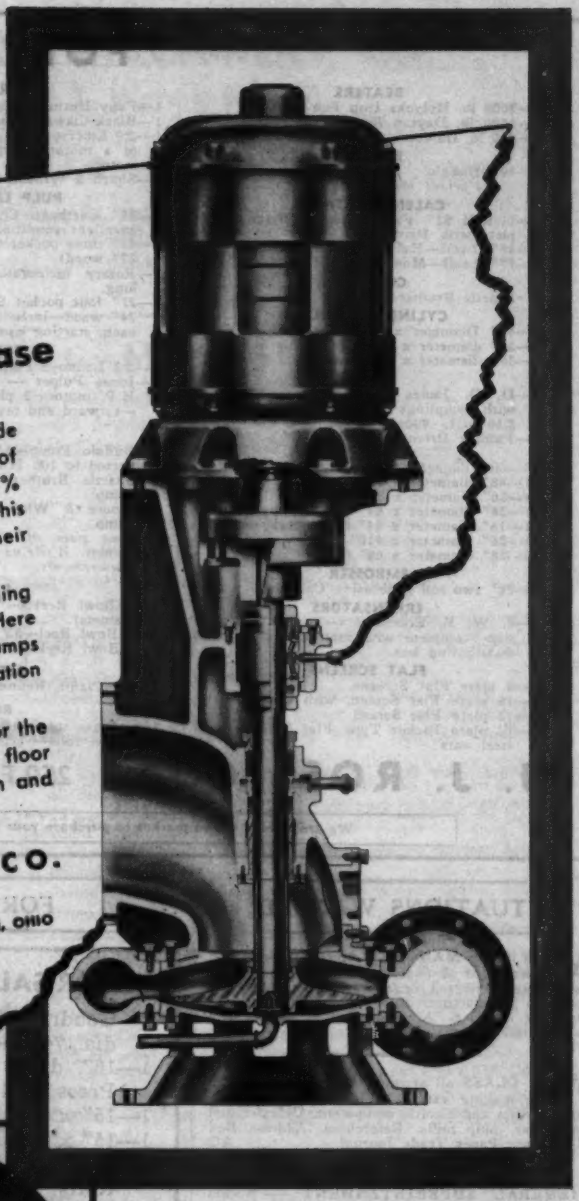
Above is a cut-away view of a pump that has made stock pumping history. Note that suction is at top of impeller which means that any stock from 1% to 6% consistency flows right to the eye of the impeller. This is in direct contrast to bottom suction pumps with their consistency limit of about 3%.

Furthermore, the Miami DV pump is self draining . . . empties itself of the last cupful of stock. Here again, this is in contrast to bottom suction pumps whose design makes impossible complete elimination of stock from bottom well.

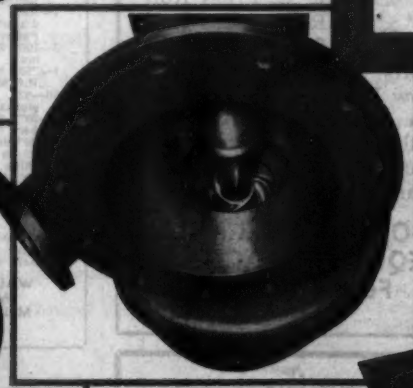
You will want this vertical pump, not only for the above advantages, but because it takes less floor space and is readily accessible for inspection and maintenance. Write for full details.

THE BLACK-CLAWSON CO.
HAMILTON, OHIO

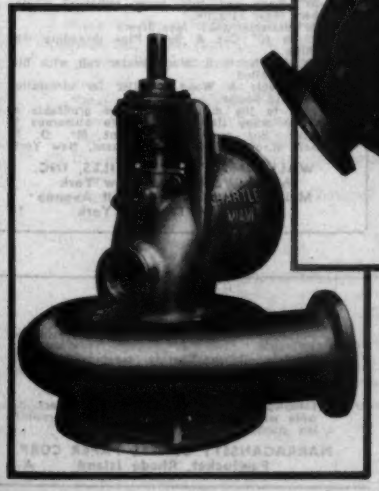
DIVS.: SHARTLE BROS. MACHINE CO., MIDDLETOWN, OHIO
Dilts Machine Works, Fulton, N. Y.



Above is a cut-away view of Miami DV vertical pump.



Note large opening to impeller eye.



Exterior view of Miami DV pump.

FOR SALE

BEATERS
2—3000 lb. Holyoke Iron Tub Beaters.
1—1000 lb. Dayton Beater.
2—400 lb. Gavit—iron tub beaters.

BLOWER
1—50" Buffalo.
Various other sizes.

CALENDER STACKS
1—11-Roll 92" Face Calender Stack—complete with Drive.
1—36" 7-roll—Holyoke Machine.
1—77" 3-roll—Moore & White.

CENTRAP
1—Shartle Brothers Centrap.

CYLINDER MOULDS
1—48" Diameter x 96" Face.
8—30" diameter x 72" face.
3—30" diameter x 74" face.

DRIVES
1—D. O. James 75 H.P. Speed Reducer with couplings and motor base. Ratio 2.16 to 1. 900 RPM to 418 RPM.
1—Pulmax Drive.

DRYERS
13—60" diameter x 154" face.
1—48" diameter x 94" face.
24—36" diameter x 82" face.
1—24" diameter x 84" face. (Baby).
1—16" diameter x 84" face. (Baby).
1—36" diameter x 116" face.
2—28" diameter x 68" face.

EMBOSSER
1—28" two roll Embossing Calender.

ERKENSATORS
3—I. W. E. Erkensators—bronze construction—complete with motors, starters and distributing box.

FLAT SCREENS
2—8 plate Flat Screens.
1—18 plate Flat Screen, with scraper.
1—12 plate Flat Screen.
2—12 plate Packer Type Flat Screens with steel vats

JORDANS
1—Pony Horne Jordan. Spare New Fillings.
1—Black-Clawson Jordan (belt driven).
1—#9 Emerson Jordan—for direct connection of a motor—requires use of 400 H.P. motor.
1—Smith & Winchester.

PULP EQUIPMENT
1—84" Carthage Chipper—complete and in excellent condition.
1—32" three pocket Glens Falls Grinder (for 27" wood).
3—Rotary incinerators—9' diameter x 20' long.
5—27" four pocket Sandy Hill grinders (for 24" wood—including 1000 H.P. motor for each, starting equipment, etc.).

PULPERS
1—#2 Lannoye Pulper.
1—Jones Pulper — direct connected to 60 H.P. motor—3 phase, 60 cycle, 440 volts —forward and reverse starting.

PUMPS
1—Buffalo Pump—3500 g. p. m., direct connected to 100 H.P. Motor (50' head).
1—Shartle Brothers duplex 10 x 20 stock pump.
1—Moore & White triplex 10 x 12 stock pump.
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

REELS
1—2 Bowl Reel — 112" face — bowls 20" diameter.
1—2 Bowl Reel—63" face.
1—2 Bowl Reel—110" face.

REFINERS
2—#1 Claflin Refiners.

ROLLS
500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

RUBBER COUCH ROLL
1—72½" Face x 9" diameter (soft rubber).

SAVEALLS
1—Shartle Bros. decker 36" diameter x 60" face, including couch roll.
1—Saveall 36" x 136" cylinder mold, anti-friction bearing equipped, including couch roll.

SHREDDERS
1—#25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder—used one year.

SHEETERS
1—110" Horne single knife rotary sheet cutter.
1—48" Langston heavy duty chopper (this is a combination machine, combining a slitter, scorer, sheeter and chopper.)

SIZING MACHINE
1—36" Waldron sizing machine.

SLITTERS
1—114" Two drum Langston Slitter & Winder.
1—110" Beloit slitter (slitter attachment only).
1—114" Two drum Kidder slitter and winder.
1—36" Koegel slitter and winder.

SUCTION BOXES
1—Nash 100" face Suction Box.
3—Brass Suction Boxes—90" drilled face.
2—Brass Suction Boxes—77½" drilled face.

SUCTION COUCH ROLL
1—Sandusky Suction Couch Roll — 18" diameter x 130" face — Complete with Sturtevant Vacuum Pump and drive mechanism.

SUCTION PRESS ROLL
1—Sandusky suction press roll, 14⅞" diameter x 68" drilled face.

WINDERS
2—65" Cameron Tensions for Winders.

J. J. ROSS CO., 250 Frelinghuysen Avenue, Newark 5, New Jersey
TEL. BIGELOW 3-3720 J-19

We are always in the market to purchase your surplus or idle machinery. What have you to offer?

SITUATIONS WANTED

AMBITIOUS MAN—40. College background. Experienced all phases fine and coarse paper, also twine. Will sell or accept responsible position with manufacturer, sales agency or distributor anywhere in U. S. A. Address Box 45-390 care Paper Trade Journal. J-26

FIRST CLASS all around Master Mechanic, in mills making various weights of board, also tissue, steam and electric equipment. Cylinder and fourdrinier, pulp mills. References. Address Box 45-391 care Paper Trade Journal. A-2

GENERAL SUPERINTENDENT — Wishes change. 25 years experience on free sheets, ground wood specialties, news and Kraft. Fourdrinier and cylinder machines. Age 43. Go anywhere. Prefer Canada. Would take position colorist or personnel manager in large mill. Address Box 45-402 care Paper Trade Journal. A-2

PLANT ENGINEER — MILL SUPERINTENDENT—Twenty years experience, in various types of Pulp and Paper mills. Construction. Power Plant Operation. Maintenance. Experimental and development work. Experienced in handling all types of help. Available at once. Address Box 45-409 care Paper Trade Journal. A-2

PERSONNEL DIRECTOR—Age 45. Seven years experience as personnel director concern of over four thousand employees. Familiar with all phases of personnel work particularly in labor negotiations, job evaluation and establishing training programs. Eighteen years manufacturing and sales service experience prior to personnel work. Address Box 45-418 care Paper Trade Journal. A-2

PLANT ENGINEER—Technical graduate with long experience in design, construction, maintenance and operation of Pulp and Paper Mills, desires position. Address Box 45-410 care Paper Trade Journal. A-9

FOR SALE

FOR SALE—ROLLS

2—Goodrich Couch Rolls, 18" dia., 74" face
1—16" dia., 78" face R. C. Press Roll
1—15" x 70" R. C. Press Roll
1—15" x 72" R. C. Press Roll
2—18" x 72" face R. C. Press Rolls
1—New Brass Couch Roll 20" dia., 96" face. All above rolls newly covered and equipped with anti-friction bearings.

OSBORNE PAPER MILL EQUIPMENT CO.
Fulton, N. Y.
J-19

FOR SALE

42 dryers consisting of 85" and 86" face —36" diameter—complete with triple deck stands, gears, bearings and piping.

One set 70 heat treated carbon steel flybars together with woods for a 62" diameter by 80" face Dilts babbitted bandless beater roll.

EMPIRE BOX CORPORATION
Garfield, New Jersey TF

FOR SALE

REVAMPING AND BUILDING MILL AND CAN OFFER FOR SALE

One large Breaker Beater complete
One small Beater Complete
1—30" Diameter X 90" Face cylinder mold
1—8x8 Shartle Duplex plunger stock pump
1—New pair cast steel double suspension spring type beater bearings for 8" diameter journal —Noble & Wood beater roll. Never used
1—Used old style lighter beam for 8" diameter journal Noble & Wood beater
1—New reinforced design lighter beam for 8" diameter journal—Noble & Wood beater roll. Pattern No. 663. Never used.
3—200 KVA —33000-2300/4000 volts transformers
1—250 H.P. slip ring motors & controls—450 R.P.M.—3 bearing base and pulley
60—92" Face steel dryer felt rolls—1—7/16" journals
1—20" Face cast iron taper pulley—2 15/16" bore taper 31"x29½"
4—36" diameter x 83" face dryers
1—6" to 10" Cox & Sons Pipe threading machine
1—48"x48" Noble & Wood beater roll with filling installed
1—40" Noble & Wood impeller for circulation stock in beater.

A visit to the mill would prove profitable as we have many items for sale to numerous to mention. See our superintendent Mr. O. P. Fussell at our plant in Walloomsac, New York.

WALLOOMSAC PAPER MILLS, INC.
Mills: Walloomsac, New York
Main Office: 25 Vanderbilt Avenue
New York 17, New York TF

FOR SALE
All in good running condition

2—3 roll Friction Glazing Calender Machines—32" wide
2—Waldron Brush Coating machines complete with festoon drying systems and rewinding machines 42" and 28" wide.
1—Waldron Reeling machine 34" wide
1—Intaglio Printing machine (single color) 32" wide with festoon drying system and rewinding machine.

NARRAGANSETT COATED PAPER CORP.
Pawtucket, Rhode Island A-2

FOR SALE | FOR SALE | FOR SALE

by JACK ROSS PAPER MACHINERY CO.

17 Porter Avenue, Newark 8, N. J., Waverly 3-5675

BELOIT FOURDRINIER MACHINE

Wire 91" by 65'—22" Suction Couch table rolls, ball bearing equipped—26 Dryers two decked 48" face 88" dia. Nine roll calender, reel, winder machine equipped with Beloit enclosed spiral bevel gear drive, Bird Screens, pumps, etc.

146" PULP DRYING MACHINE

2 Cast Iron Vats with cylinders 48" x 146"—Couch rolls 124" diameter—3 sets of presses hydraulically controlled—64 dryers 48" x 144", four tiers high, complete with piping, drives, Hamblet Cutter, layboy and crane. This machine is on its original foundation.

1—Improved Paper Machinery Company 3 roll Hydraulic Wet Machine. Cylinder Mold 36" diameter 84" face. Complete with enclosed drive. Prints and photos on request. Used 1 year.
2—Pusey & Jones Horizontal Digesters. Welded equipment with Logan Circulators. 24' high and 7' diameter. 125# working pressure. Prints on request.
1—Guyton-Cumfer Saturator. Tank 50" wide. 5 gates complete. Prints on request.
1—Moore & White Flat Screen. 16 plates 12" x 24" .015 cut.
1—Moore & White Flat Screen. 20 plates 12" x 24" .015 cut.
1—Packer Flat Screen. 10 plates 12" x 42" .015 cut.
1—2" to 6" Oster Pipe Threading Machine. Direct connected to motor 440-3-60.
4—Driers—112" face x 48" diameter complete with 2 deck frames, gears, etc.
1—A. D. Wood Saveall—cylinder—60" face by 48" diameter—ball bearing equipped—rebuilt—specifications on request.
1—No. 1 Voith Pulper—capacity 20 tons per day—requires 20 h.p.
1—42" Liner and combining machine. Fourteen 6" diameter steam heated rolls and one drier 24" diameter.
3—Improved Paper Machy. Corp. #2 Knotters Bronze fitted. Good condition. Prints on request.
2—14" x 20" Connersville Vacuum Pumps. These pumps are fully rebuilt.
3—12" x 18" Connersville Vacuum Pumps. These pumps are fully rebuilt.
1—Downingtown 2500 lb. Iron Tub Cyclone Beater. Beater rolls 60" face, 72" diameter. This beater is in excellent condition, having been in operation less than 2 years. Prints on request.
2—Holyoke Platers—2 roll, 36" face x 18" diameter—complete with drive.
1—Nichols-Herreshoff Lime Kiln—vertical 65 tons capacity. Prints on request.
1—72" two drum Pusey & Jones Slitter & Winder will rewind 40" diam. rolls.
1—100" two drum Warren Slitter & Winder.
1—100" Two Bowl Reel—Bowls 20" diam.
1—E. D. Jones Standard Jordan with fast coupling and extended base for direct connection to motor.
1—Williams #30 type G. A. Bark Hog with 125 h.p. Synchronous motor. Ball bearing equipped and new spare parts—used one year.
1—Sumner Disc Barker—72" diam. disc. Anti-friction bearings. Direct connected 30 h.p. motor. Used 5 months.
1—140" two drum Warren Slitter & Winder.
40 Driers—96" face x 28" diameter complete with 2 deck frames, gears and bearings.
1—Sturtevant Bale Pulper with conveyor complete with 150 h.p. motor and starter.
8—10" x 20" Shartle Brothers Triplex Stock Pumps.
1—12" x 20" Shartle Brothers Triplex Stock Pumps.
1—8" x 18" Shartle Brothers Triplex Stock Pumps.
1—8" x 10" Worthington Triplex Stock Pumps.
2—12" x 12" Goulds Triplex Stock Pumps.
1—72" Seybold Automatic Knife Grinder with motor. (Like new.)
2—1000 lb. Horne Iron Tub Beaters. Link Belt Chain Drive.
1—1200 lb. Holyoke Wood Tub Beater.
1—100" Proctor & Schwartz festoon drier—complete.
1—Trimbey Pulp Screen perforations. 090—30 tons capacity.
1—750 lb. Downingtown Iron Tub Beater. Beater roll 36" face, 52" diameter. Iron Midfeather. Iron hood. Excellent condition. Used three years.
1—30 h.p. Allis Chalmers Motor. 600 RPM 2300 Volts. 3 phase. 60 cycle.
1—40 h.p. Fairbanks Morse Motor. 3600 RPM. 3 phase. 60 cycle.
2—Beloit Fourdrinier Shakes.
1—Lobdell 124" 9 roll Calender stack with Warren Doctors. Beloit Hypoid Drive.
1—Farrell 104" 10 roll Calender Stack with Warren Doctor. Beloit Hypoid Drive.
1—Pusey & Jones 104" 11 roll Calender Stack with Warren Doctors Master Gear Drive.
2—Pusey & Jones 104" face and 115" face Removable drum reels.
1—Warren 104" 2 drum low type slitter and winder. Will rewind rolls 40" dia.
1—Warren 116"—2 drum low type slitter and winder. Will rewind rolls 40" dia.
1—Warren water pump 4800 gals. p. m. 80' head 690 r.p.m. Used 1 year.
1—Frederick 5" Centrifugal stock pump 600 g. p. m. 50' head. 1165 r.p.m.
1—Midwest Centrifugal Stock Pump 6". New.
40—Driers 36" diameter 86" face. 3 deck frames, gears, bearings, etc.
Battery of 4 Waterville Grinders, plates and heads in excellent condition.
100" Hamblet duplex sheeter with Reeves drive and assorting table.
1—Warren Brake Target with 2 stage Warren pump size 6-200' head 1170 r.p.m.
1—Sandy Hill Packer Flat Screen 8 plates with scraping device. New type roller cams. Used two years.
2—Sandy Hill Flat Screens 8 plates with scraping device.
1—Bliss Box Assembling Machine. Used 6 months.
1—Better Package Inc. Counter boy turntable with compressor and sealing tape holder.

Cash purchaser of all types of paper, pulp and converting equipment.

From single items to complete plants.

Write, telephone or wire whatever you have for sale.

FOR SALE | FOR SALE | FOR SALE

THE FOLLOWING MATERIAL NOW SETTING UP IN MILL

CALENDERS 124" nine roll, box frame, Lobdell. Bottom roll 24" dia. two 16" dia. int. 11½-12" dia. Warren doctors. Beloit hypoid drive, new 1936.

104" ten roll, box frame, Farrel. Bottom roll 20" dia. one 10"; seven 10" and top 14". Warren doctors. Beloit hypoid drive, put in 1936.

104" eleven roll, box frame, Pusey & Jones. Bottom roll 18" dia. int. and top 9½-10" dia. Four rolls bored for steam. Warren doctors. Mortise gear drive.

REELS: Two—104", also one 115". Pusey & Jones offset with removable drums about 18" dia. slip belt disc for each drum. Drums about 33" on centers.

SLITTERS & WINDERS: Two 104" Warren two drum with low type slitter, 1 R.H. and 1 L.H.

SCREENS: Two 8 plate open side Packer with 12 x 43 screen plates.

PUMPS: 2—18 x 12 Goulds triplex stuff.
1—10 x 20 Shartle triplex stuff.
1—12 x 20 Shartle triplex stuff.
1—12 x 16 Shartle triplex stuff.
1—7 x 16 Shartle duplex stuff.

PUMPS: 1—Warren water pump, type 12 DL24, capacity 4800 GPM 80 ft. head, 690 RPM, new 1940.
1—Frederick 5" cent. stock, type TS, 50 ft. head, capacity 600 gallons, 1165 RPM.
1—Midwest Eng. Co. 6" suction and 6" discharge, new.

BEATERS: 2—Horne patent iron tub.
1—Holyoke broke.

SHAFTS & CORES: 11—72 x 6½ cutter shafts and 28 143 x 2¾-3½ O.D. coreshaft, also 11—151 x 2¾-3½ O.D. core shaft.

HOISTS: Four 5 ton Ingersoll Rand Air Hoists with trolley and I beams new 1927.

STITCHER: 1—Bliss Box Assembling Machine Model H.

PACKAGE: 1—Better Packages Inc. counterboy turntable table with compressor and motor with sealing tape holder.

TARGET MACHINE: 1—Broke target machine, tank about 8 ft. dia. x 18 ft., capacity two tons, ten years old, with two stage 6" Warren pump, type 250 D19, 100 HP, 200 ft. head, 1170 RPM.

FRANK H. DAVIS COMPANY, 175 Richdale Ave., Cambridge 40, Mass. J-19

FOR SALE

Heavy press part with 24 x 136" Downingtown extractor roll, one rubber covered press roll 22 x 136"; one rubber covered press roll 21-7/16 x 132½"; one brass covered press roll 22 x 133. Two pair main press housings and bottom frame. Sixteen copper covered felt rolls 139" face; also two cylinder molds 36 x 136"; and four pair of vat ends.

SHARTLE BROTHERS MACHINE CO.
Middletown, Ohio J-19

FOR SALE

32 Dryers, 36" dia., 68" face complete with frames, gears and packing boxes
40 Dryers 36" dia., 84" face complete with frames and gears
1—Dryer 48" dia., 120" face

OSBORNE PAPER MILL EQUIPMENT CO.
Fulton, N. Y. J-19

FOR SALE—PUMPS

1—Shartle 10" x 20" Triplex Stock Pump practically new
1—10" x 12" Moore & White Triplex Stock Pump.
1—Beloit 8" x 12" Duplex Stock Pump
1—Frederick 12" x 8" Centrifugal Stock Pump, will handle 100 tons per day against 75 ft. head, bronze impeller, full length base, belt driven.
6—10" inlet 6" outlet Downingtown Centrifugal Stock Pumps with hand cleanouts. Belt driven type.
1—Shartle 10" x 6" Centrifugal Stock Pump.
4—New Centrifugal Water Pumps anti-friction bearings, full length base designed for direct connecting, 150 G.P.M. 75 ft. head.
1—Hill Dean 4" x 4" Centrifugal White Water Pump, anti-friction bearings, either belt driven or direct connected.
1—Hill Dean 10" x 8" White Water Circulating Pump, belt driven.
2—6" x 4" belt driven Fan or Circulating Pumps.

Every pump reconditioned and guaranteed.

OSBORNE PAPER MILL EQUIPMENT CO.
Fulton, N. Y.
J-19

FOR SALE

2—63" Dietz Toilet Converters.
1—81" Dietz Toilet Converter.

J. J. ROSS COMPANY
250 Frelinghuysen Ave.
Newark 5, N. J.
Telephone Bigelow 3-3720 J-19

FOR SALE

1—60 H.P. Fairbanks Morse Diesel Engine, connected to a 40 KVA Generator.

1—100 H.P. Ames Steam Engine, connected to a 75 K.W. Westinghouse Generator.

1—150 H.P. G. E. Induction Motor—3/60/220—875 r.p.m.—including starting equipment.

J. J. ROSS COMPANY
250 Frelinghuysen Ave., Newark 5, N. J.
Bigelow 3-3720 J-19

CLASSIFIED ADS BRING RESULTS

PAPER COATING MACHINERY — Waxing Oiling, Gumming, Gluing, Carbon, Laboratory Coating and Treating Machines. High speed. New improvement. MAYER MACHINE COMPANY, Inc., 1155 Scottsville Road, Rochester, 11, N. Y. TF

FOR SALE—64" Seybold Twentieth Century Cutter, guaranteed to be in good working order. Address Box 45-423 care Paper Trade Journal. J-19

FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore, 30, Md. TF

FOR SALE

FOR SALE

1—7-roll 48" wide Holyoke Super Calender Stack, complete with 50 H.P. G. E. a.c. 3 phase 60 cycle, 220 volt motor equipment. Machine in perfect condition.
1—62" Heavy Type Hudson Sharp two-shaft Center Wind Slitter and Rewinder. Very suitable for board work.
1—60" Universal Type No. 6 Cameron Slitter and Rewinder. Complete and in A-1 condition.
1—Complete Pulp Drying Machine with 80 Dryers 48" x 146".
1—48" Kidder Shear Cut Model S.L. Slitter and Rewinder.
1—Noble & Wood Pony Jordan. Good condition.
1—30" Camachine 44W Low Model Roll Rewinder. Complete and in good condition.
1—22 Lancaya Pulper complete with 40 H/P A.C. motor equipment. A-1 condition.
2—Toilet Paper Perforators for 81" wide rolls, one Dietz and one Hudson Sharp.
1—110" Double-Drum Waldron late type shear cut hydraulic Slitter and Rewinder.
1—12" x 14" Brownell Variable Speed Engine, equipped with Moore & White Speed Change, Governor and Overspeed Protection. A-1 condition.
1—50" Meisel Double Drum Type OP Series Shear Cut Slitter and Rewinder.

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y.
TF

FOR SALE

1—Oliver United Filter or Saveall, 8'6" dia. 12 ft. long. All metal vat, fully reconditioned, ready to run.

OSBORNE PAPER MILL EQUIPMENT CO.
FULTON, N. Y.
J-19

FOR SALE—International FC Folding and Gluing machine, range from 1¾" to 16" wide folded flat and from 9" to 30" in length. For further particulars address Box 45-412 care Paper Trade Journal. J-19

FOR SALE—DRYER Felt, new, Fitchburg, size 92" x 86 yds. weighing 728 lbs., also Wet felt, Waterbury, size 46' x 92". Thomson Paper Mills, Inc., Thomson, N. Y., Tel. Schuylerville 74. A-2

FOR SALE—Two Color Oil Printer for Paper Bags. Address Box 45-414 care Paper Trade Journal. J-26

FOR SALE—Duval Printer for Paper Bags. Available in Brooklyn. Address Box 45-415 care Paper Trade Journal. J-26

FOR SALE—Nekoosa Uniform Chip Cutter, size 20. Address Box 45-416 care Paper Trade Journal. J-26

FOR SALE—44" Kidder and 45" Langston Slitters; 60" Moore & White 2-drum Rewinder; 30" and 34" Waldron 7-color Wall Paper Printing Machines with conveyors and reels. Address Box 45-408 care Paper Trade Journal. J-19

FOR SALE

PAPER MILL & PAPER CONVERTING EQUIPMENT FOR SALE

34" Inman Slitter.
42" Firsching Cloth Slitter.
36" Sheridan Automatic Power Paper Cutter.
44" Seybold Holyoke Aut. mill type Power Cutter.
48" White Automatic Power Cutter.
80" Finley Shooter.
110" Hamblet heavy duty Shooter.
88" Rice Barton & Fales Slitter & Rewinder, for use on dry end of paper machines.
120" Moore & White 4-drum Rewinder.
New 62" Two-Roll Sack Stand, handling rolls up to 30" diameter.
4 Waldron 36" Paper Reelers
Baling Machines, both hand and power.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18, N. Y.
TF

FOR SALE

New and guaranteed used steel pipe, boiler tubing, valves, fittings, wood and steel tanks, steel buildings

JOS. GREENSPON'S SON PIPE CORP.
NATIONAL STOCK YARDS, Illinois.
5-6

FOR SALE—Black-Clawson #2 Jordan. Reconditioned with Ryertex bearings, ¾" steel fillings practically new. Two bearing construction, without main base. Address Box 45-388 care Paper Trade Journal. J-26

WANTED

WANTED

S.O.S. Bag Machines. Please write full information as to age, make, condition, range, speed and price.

Address Box 45-400 care Paper Trade Journal. J-19

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED—2 Hamblet Sheeters, 40" to 48". Urgent. Private party. Address Box 45-406 care Paper Trade Journal. J-19

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 44-835 care Paper Trade Journal tf

WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

BLANKETS

Converted From Your Used Felts

Write for Full Details

BLOOMFIELD WOOLEN COMPANY
BLOOMFIELD, IND.

WANTED

WANTED

4 to 6 cylinder machine with trim from 60" to 86".

Address Box No. 45-373
care Paper Trade Journal J-19

WANTED—12" Weiner Refiner. Address Box 45-413 care Paper Trade Journal. J-19

WANTED—Die Press-Seybold or Sheridan or any other good make. BLEYCO PAPER CORP., 214 Sullivan Street, New York. J-19

WANTED—2 Jordans, arranged for motor drive, about 20 ton capacity. Address Box 45-419 care Paper Trade Journal. A-2

The right man may be seeking a job in an advertisement in this section.

The machine or the material you urgently need may be advertised right here in these columns.

Read Them, Use Them—If you need something, advertise for it—if you have something to sell tell the industry about it—Everybody reads the Clearing House.

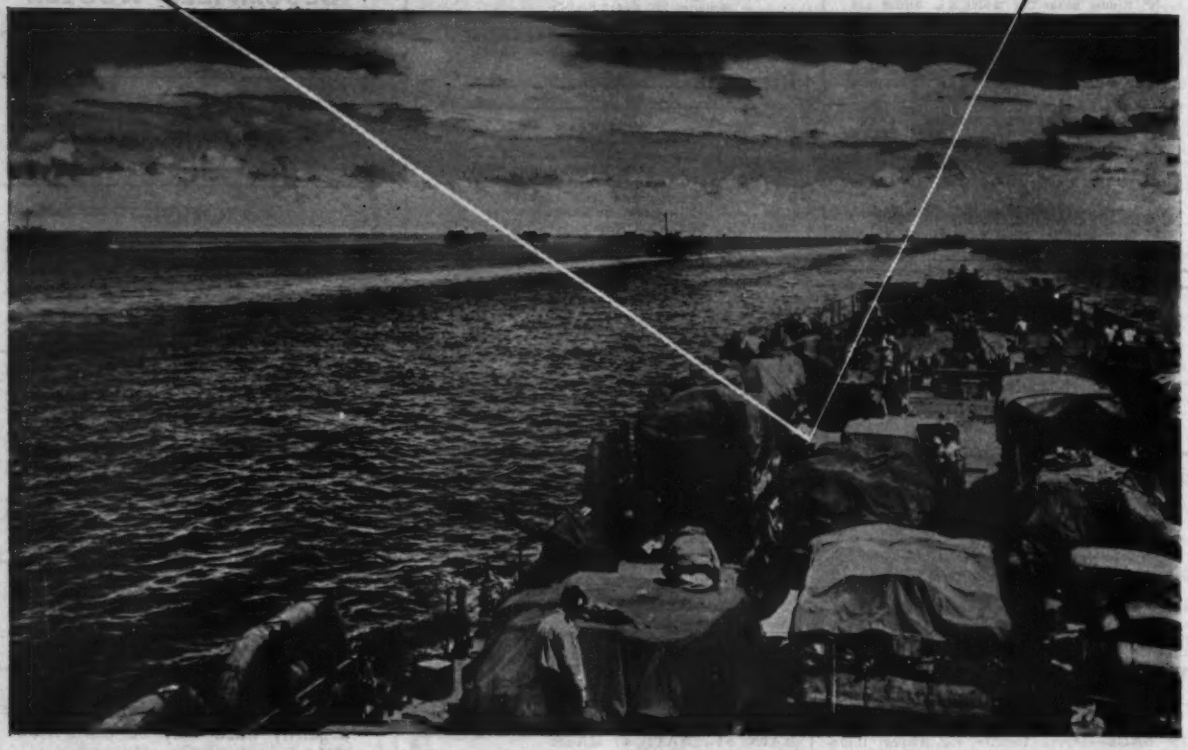
WEIGHING while conveying with the WEIGHTOMETER
Wood Chips, Salt Cake, Sulphur, Coal, Etc.
MERRICK SCALE MFG. CO.
PASSAIC, NEW JERSEY

Appleton Felts
APPLETON WOOLEN MILLS
APPLETON, WISCONSIN

RM
MANHATTAN and Condor
Rubber Products for INDUSTRY
THE MANHATTAN RUBBER MFG. DIVISION
OF RAYBESTOS-MANHATTAN, INC.
Executive Offices Passaic, New Jersey

38 POINTS of SUPERIORITY
Type 36-2
ROTARY DISC REFINER
SPROUT-WALDRON & CO. MUNCY, PA.

On their Way again to Win again!



Are You?

Today the veterans of our European victories are sailing to final triumph in the Pacific! Meanwhile patriotic American industrial leaders are following a full-speed-ahead program to hasten peace through the Payroll Savings Plan!

From coast to coast, veteran Bond salesmen—and women—who put over the Mighty 7th, are once more mustered into service for plantwide selective resolicitation campaigns. These special efforts to keep employee Bond buying at a maximum are directed toward two major objectives:

A To hold every new 7th War Loan subscriber on the Payroll Savings Plan books—maintaining and, wherever possible, increasing present Bond allotments.

B To convince all regular subscribers who recently stepped up their Bond buying, of the many advantages of continuing on this foresighted, extra-Bonds-for-the-future basis.

Back up our fighting men who have won one war—and will win another. Use selective resolicitation to make your Payroll Savings Plan more effective—put a tighter rein on inflationary tendencies—build peacetime prosperity.

The Treasury Department acknowledges with appreciation the publication of this message by

PAPER TRADE JOURNAL

★ *This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and War Advertising Council* ★

ARE YOU READY FOR "V" DAY?

Prepare NOW to Take Care of Increased Orders Which Will Come. Consider Necessary Repairs and Maintenance.

Also New Equipment of Improved Designs and Efficiency.

PAPER BAG MACHINERY—PAPER MACHINES

THE NEW MODEL "E" PAPER TRIMMERS

THE SMITH & WINCHESTER
MANUFACTURING COMPANY
Plant and Offices at South Windham, Connecticut

NEW MODEL • HIGHEST ACCURACY
CHRONOMETRIC
TACHOMETER

Readability to 1 RPM per division. Guaranteed accuracy well within ½ of 1%. Indicates RPM directly on the dial without any calculations over a fixed period of 6 seconds. Negligible torque. Two models with ranges 0-1000 RPM or 0-10,000 RPM, each suitable for double rated range.

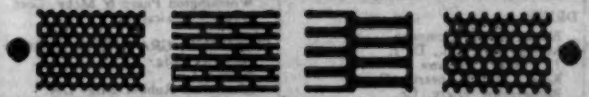
Write for Bulletin No. 715

HERMAN H. STICHT CO. INC.
27 PARK PLACE NEW YORK N. Y.

MISCO "C"
THE CORROSION RESISTANT ALLOY
CAST • ROLLED • FABRICATED
for all equipment exposed to corrosion by sulphite acids
MICHIGAN STEEL CASTING CO., DETROIT 7, MICH.

***When you think of* PAPER**
***Think of* MILLAR**
Paper is Our Business
GEO. W. MILLAR & CO., Inc.
280-290 Lafayette St., New York 12, N. Y., Tel. CAnal 6-0980
WORCESTER, MASS. HARTFORD, CONN.

SCREENS
of Perforated Metal



The Harrington & King Perforating Co.

5652 Fillmore St., Chicago 44, Ill. 114 Liberty St., New York 6, N. Y.

Keep 'Em Rolling Faster with Magnus Slime Remover

You can't afford the wasted stock and the shut-downs caused by slime in these days of critical paper shortage. Nor can you afford the time to clean up slime manually.

Magnus Slime Remover involves no manual cleaning operations. It loosens and disperses slime deposits and inhibits slime formation by killing the bacteria and micro-organisms which cause it. Put through the system from the beater to the end, and followed by a thorough flush-through with water, you can quickly and economically clear your machines of slime. Ask for complete data.

Magnus MAGNUS CHEMICAL CO. 24 SOUTH AVENUE, GARWOOD, N. J.
Paper Mill Cleaners

Since 1901

Dietz Machine Works

MANUFACTURERS

TOILET ROLL CONVERTING MACHINES
TOWEL ROLL CONVERTERS
SPECIAL MACHINERY
ANILINE PRINTERS
TOWEL INTERFOLDING MACHINES
ROTARY CARD CUTTERS
SLITTERS FOR VULCANIZED FIBRE
128 W. Fontaine St.
PHILADELPHIA 22, PA.

For High-Speed, Dependable
PAPER CONVERTING MACHINES
contact
POTDEVIN

Paper Bag Machines, Aniline & Oil-Ink Presses, Waxing, Gluing, Varnishing, Laminating Machines.

POTDEVIN MACHINE CO.
EST. 1901
1223 38th ST. BROOKLYN N. Y.

WHERE TO BUY

ABRASIVES
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Monsanto Chemical Co.
Norton Co.

ADHESIVES
American Resinous Chemicals Corp.
Arabol Mfg. Co.
National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
United States Rubber Co.

AGITATORS
Appleton Machine Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
H. K. Porter Company Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

BAG MACHINES
Thomas W. Hall Co., Inc.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
Fibre Making Processes, Inc.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BEARINGS
Black-Clawson Company
Jones, E. D. & Sons Co.
The Manhattan Rubber Mfg. Co
Montague Machine Works
Rollwer Bearing Co.
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
SKF Industries Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Woods' Sons Company

BEATERS & JORDANS
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Herman Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BELTING
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
Graton & Knight Company
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machinery Corp.

BLEACHING APPARATUS
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Pennsylvania Salt Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BOTTOMS
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.
Valley Iron Works Co.

BUILDERS—PAPER MILLS
Merritt-Chapman & Scott Corp.

CALENDERS
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Moore & White Co.
Black-Clawson Company
Perkins & Son, Inc., B. F.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASEIN
Packing Products Co.

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Port Pitt Steel Casting Co., Div. H. K. Porter Company, Inc.
The Frederick Iron & Steel Co.
Grinnel Company
Hamblet Machine Co.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Smith & Winchester Mfg. Co.
Traylor Engineering & Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross J. O. Eng. Co.
Shartle Brothers Machine Co.

CHEMICALS
Amer. Cyanamid & Chem. Corp.
American Resinous Chemicals Corp.
Ansul Chemical Co.
Calco Chemical Co.
Diamond Alkali o.
Dispersion Process Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Geigy Co., Inc.
Gottesman & Co.
Hooker Electrochemical Company
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Stauffer Chemical Company
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

CLEANING MATERIALS
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
E. I. du Pont de Nemours & Co., Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Nichols Engrg. & Research Corp.
Oakite Products, Inc.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp.
J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Stearns Magnetic Mfg. Co.
Valley Iron Works Co.
T. B. Wood's Sons Company

COATING MACHINERY
Hudson Sharp Machine Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machinery Corp.

CONSTRUCTION ENGINEERS
Merritt-Chapman & Scott Corp.

CONSULTING ENGINEERS
W. H. L. D. Betz
Frederic C. Clark
Ferguson, Hardy S.
Hardy, George F.
Johnson & Wierk, Inc.
The Kohler System Company
Main, Inc., Chas. T.
J. E. Sirrine & Co.
Stone & Webster Engrg. Corp.

CONTROLS
The Bristol Company

CONVEYORS
Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

CORES
Elixman Paper Co.
Sonoco Products Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Plohn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel
E. D. Jones & Sons Co.
Lovejoy Flexible Coupling Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Corporation
T. B. Wood's Sons Company

CUTTERS
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DE-INKING
Kinsley Chemical Co.

DIGESTERS
H. K. Porter Company Inc.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers
United States Rubber Co.
Westinghouse Electric Corporation

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric Corporation

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Fibre Making Processes, Inc.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EQUIPMENT INSTALLATION
Merritt-Chapman & Scott Corp.

EVAPORATORS
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Traylor Engineering & Mfg. Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Builders-Providence, Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup
Traylor Engineering Co.
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc.
Draper Bros. Corp.
Hurck & Son, P. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co.

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Colloid Co.
Amer. Cyanamid & Chem. Corp
American Resinous Chemicals Corp.
W. H. Loomis Talc Corp.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Moore & White Co.
J. O. Ross Engrg. Corp.
Worthington Pump & Mchy. Corp
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

WHERE TO BUY

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Fibre Making Processes, Inc.
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Rose Engineering Corp., J. O.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Worthington Pump & Mchy Corp.

HOISTS
Appleton Machine Co.
Ditts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
N. P. Bowsher
The Bristol Company
Builders-Providence, Inc.
The Foxboro Company
General Electric
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taber Instrument Corp.
Taylor Instrument Cos.
Wallace & Tiernan Co., Inc.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Ditts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
W. H. & L. D. Betz
Ditts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

LUBRICATORS
Hills-McCanna Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.

Lobdell Car Wheel Co.
Walker-Goulard-Plehn Co.

MIXERS
H. K. Porter Company
Youngstown Welding & Engrg. Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Rose Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPERMILL BUILDERS
Merritt Chapman & Scott Corp.

PAPER TUBE MACHINERY
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Pontevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

PLATERS
Perking & Son, Inc., B. F.

PLATES
Black-Clawson Company
Hendrick Mfg. Co.
J. O. Rose Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Pontevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer C.

PUG MILLS
Traylor Engineering & Mfg. Co.

PULPS
Anderson Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Elof Hansson, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Hills-McCanna Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Rose Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company
Worthington Pump & Machinery Corp.

RECOVERY SYSTEMS
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Rose Engineering Corp. J. O.
Valley Iron Works Co.

RECTANGULAR BINS
Traylor Engineering & Mfg. Co.

REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Ditts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Rubber Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric Corporation

RESINS
American Cyanamid & Chemical Corp.
American Resinous Chemicals Corp.
The Resinous Products & Chemical Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Son Co.
Pusey & Jones Corp.
Rockbin Engraving Co.
J. J. Rose Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Youngstown Welding & Engrg. Co.

ROLL STANDS
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Pontevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROTARY KILNS
Traylor Engineering & Mfg. Co.

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Pontevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

SCALES
Builders-Providence, Inc.
Merrick Scale Mfg. Co.

SCREEN PLATES
Pitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Ditts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Rose Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.

SCRUBBERS
Traylor Engineering & Mfg. Co.

SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.

SIZES
American Cyanamid & Chemical Co.
American Resinous Chemicals Corp.
Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co.
National Oil Products Co.
Paper Makers Chemical Department Hercules Powder Co.
Pioneer Salt Company
Socony-Vacuum Co.
Philadelphia Quartz Co.

SLITTERS
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Ditts Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Pontevin Machine Co.
Rotogravure Engrg. Co.
J. J. Rose Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SPRAY NOZZLES
The Spray Engineering Co.

STAINLESS STEEL
Allegheny Ludlum Steel Co.
Eastern Stainless Steel Corp.
Industrial Steels, Inc.

STARCH
American Cyanamid & Chemical Corp.
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

WHERE TO BUY

STEAM SPECIALTIES
Johnson Corp.
Shartle Bros. Mch. Co.
Stubbs Steam Specialties Co.

STRAPPING & STRAPPING MACHINES
Acme Steel Company
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

SULPHUR
American Cyanamid & Chemical Corp
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

TALC
American Cyanamid & Chemical Corp
W. H. Loomis Talc Corp.
International Talc Company

TANKS
Frederick Mfg. Co.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.

Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co

THICKENERS, DECKERS & SAVEALLS
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

TITANIUM
E. I. Du Pont de Nemours & Co
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

TOOLS
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

TRUCKS
Elwell Parker Electric Co.
Wright-Hibbard Ind. Elec. Truck Co

TRAPS
Armstrong Machine Works
Crane Co.
Grinnel Company
Johnson Corporation
Shartle Bros. Mch. Co.

TUBS
Rodney Hunt Machine Co.
Noble & Wood Machine Co
Shartle Brothers
Valley Iron Works Co.

TURBINES
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric Corp.
Worthington Pump & Machinery Corp.

USED EQUIPMENT
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co

VALVES
The Bristol Company
Crane Company
Dilts Machine Works
Fibre Making Processes, Inc.
The Foxboro Company
Hills-McCanna Co.
E. D. Jones & Sons Co.
Kennedy Valve Mfg. Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co
The Permutit Company
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

VATS & VAT PARTS
Union Machine Co.
Union Screen Plate Co.

WASHERS
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co
Valley Iron Works Co.

WATER CONDITIONING
The Permutit Company

WAXING MACHINERY
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric Corp.

WET MACHINES
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WINDERS AND REWINDERS
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
Johnstone Eng. & Machine Co.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

WIRES
Appleton Wire Works
Black-Clawson Company
Bulkley, Dunton Pulp Co. Inc
Cheney Bigelow Wire Works
Hayden Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Shartle Brothers Machine Co.

ALPHABETICAL INDEX TO ADVERTISERS IN THIS ISSUE

A

Ames Company, B. C. 5
American Anode, Inc. 26
Appleton Wire Works, Inc. 56
Appleton Woolen Mills 63

B

Bahr Bros. Mfg. Co. 56
Bauer Brothers & Co. 55
Binney & Smith Co. 51
Black-Clawson Co. 59
Bloomfield Woolen Co. 63
Boston & Maine R. R. 3

C

Calco Chemical Div. 33
Cambridge Instrument Co. 48
Cameron Machine Co. 13
Cincinnati Rubber Mfg. Co. 47
Classified Advertising 58
Clark, Frederic C. 56
Columbian Carbon Co. 51

D

Davis Company, Frank H. 62
DeLaval Steam Turbine Co. 56
Diamond Alkali Company 15
Dietz Machine Works 65
Dilts Machine Works 59
Downingtown Mfg. Co. 2

E

Eastern Stainless Steel Corp. 36

F

Ferguson, Hardy S., & Co. 56
Fibre Making Processes 55

G

General American Transportation Co. ..... 6 & 7
Gibbs-Brower Co., Inc. 63
Goodrich Chem. Co., Amer. Anode, Inc. 26
Gottesman & Co. ..... Front Cover
Greene, Tweed & Co. 51

H

Hall, Thomas W., Company 63
Hansson, Inc., Elof 35
Hardy, George F. 56
Harrington & King Perforating Co. 65
Hendrick Mfg. Co. 56
Hercules Powder Co. 25
Hooker Electrochemical Co. 17
Horton Manufacturing Co. 8

I

Improved Paper Mchy. Corp. 29

J

Johnson & Wierk, Inc. 56

K

Kalamazoo Tank & Silo Co. 57
Kennedy Valve Co. 49
Kinsley Chemical Co. 56
Kohler System Co. 56

L

Langston Co., Samuel M. 23
Lobdell Company 53
Lovejoy Flexible Coupling Co. 53

M

Magnus Chemical Co. 65
Main, Inc., Chas. T. 56
Manhattan Rubber Co. 63
Merrick Scale Mfg. Co. 63
Merritt-Chapman & Scott Co. 56
Moore & White Company 56
Michigan Steel Casting Co. 65
Millar & Co., Inc., Geo. W. 65

N

National Oil Products Co. 69
Niagara Alkali Company 19

O

Oakite Company 57

P

Perkins & Sons, Inc., B. F. 31
Potdevin Machine Co. 65
Price & Pierce, Ltd. 57
Pusey & Jones Corp. 10

R

Raymond Service, Charles P. 58
Reichhold Chemicals, Inc. 22
Ross, J. J., Company ..... 60 & 62
Ross Paper Machinery Co., Jack 61
Rust Engrg. Co. 56

S

Shartle Bros. Machine Co. 59
Shelley, John G. 56
Sinclair Refining Co. 9
Smith & Winchester Mfg. Co. 65
Sprout, Waldron & Co. 63
Stauffer Chemical Co. 57
Sticht Co., Inc., Herman H. 65
Swenson Evaporator Co. 32

T

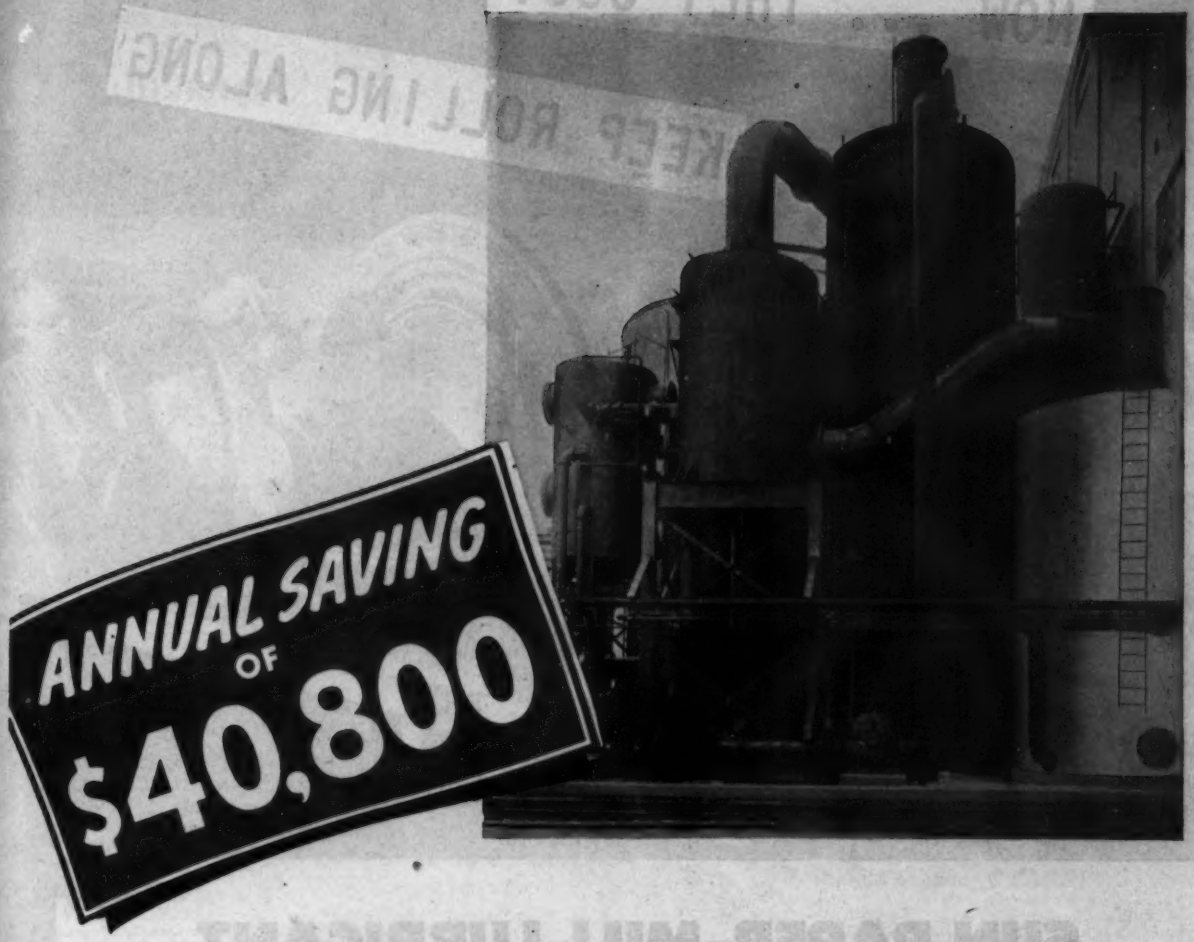
Taylor Forge & Pipe Works 30
Texas Company 4
Tidewater Assoc. Oil Co. 50
Timken Roller Bearing Co. ..... Back Cover
Titanium Pigment Co. 16
Traylor Engrg. & Mch. Co. 49

U

U. S. Rubber Co. 18

W

West Virginia Pulp & Paper Co. 55
Whiting Corporation 32
Wyandotte Chemicals Corp. 27



Made by Blowdown Heat Recovery on TOTAL INVESTMENT of LESS THAN $25,000

at a Southern Sulphate Pulp Mill

Any system for recovering heat from digester blowdown in sulphate mills must be free from plugging with pulp fibres if it is to be completely successful. Such an installation has been in service at a prominent southern sulphate mill for several years and has effected a yearly saving of $40,800. The system serves seven digesters of 3150 cu. ft. each and the investment was less than $25,000.

The heat recovered from blowdown by this method approximates 2,200,000 Btu. per ton of pulp produced. This is equivalent to the heating of 3770 gallons of washwater from 70 deg. F. to 140 deg. F.

The value of heat recovered from blowdown is dependent upon the cost of primary fuel, since water must be heated by steam from the power plant if the heat in the blows is not recovered.

The recovery system saves its first cost in less than a year.

FOSTER WHEELER CORPORATION • 165 Broadway, New York 6, N. Y.

FOSTER FW WHEELER

7068-4

NOW ... THEY JUST KEEP ROLLING ALONG

SUN PAPER-MILL LUBRICANT...

Smoothed-Out Machine's Operation, Stepped-Up Production, Ended Oil Splatter

Bearings, loaded with carbon, were causing heavy drag and power-loss on a big paper machine. A well-known brand of oil was in use, but drier-roll troubles were hampering production. Bearing-failures were encountered, and the machine and the area surrounding it were always stained with dirty oil.

A Sun Engineer was called in and made a careful study of the temperatures and conditions affecting the oil, then recommended a Sun lubricant that not only withstands those conditions but stays in the bearings.

Smooth machine-operation was immediately achieved, and the mill superintendent now reports that he has made substantial savings in oil-and-maintenance costs. Not one bearing-failure has developed in eight years. Cleanliness is no longer a problem.

Tough lubrication problems are often a combination of unusual circumstances. And Sun Engineers often help find the right oil to satisfy all aspects of the problem. Their experience, plus the quality and diversity of Sun industrial products, is helping many mills to eliminate trouble, to speed-up production, and to save money. Call the Sun man near you, or write . . .

SUN OIL COMPANY · ***Philadelphia 3, Pa.***

Sponsors of the Sunoco News Voice of the Air — Lowell Thomas

SUNOCO **SUN INDUSTRIAL PRODUCTS**

OILS FOR AMERICAN INDUSTRY